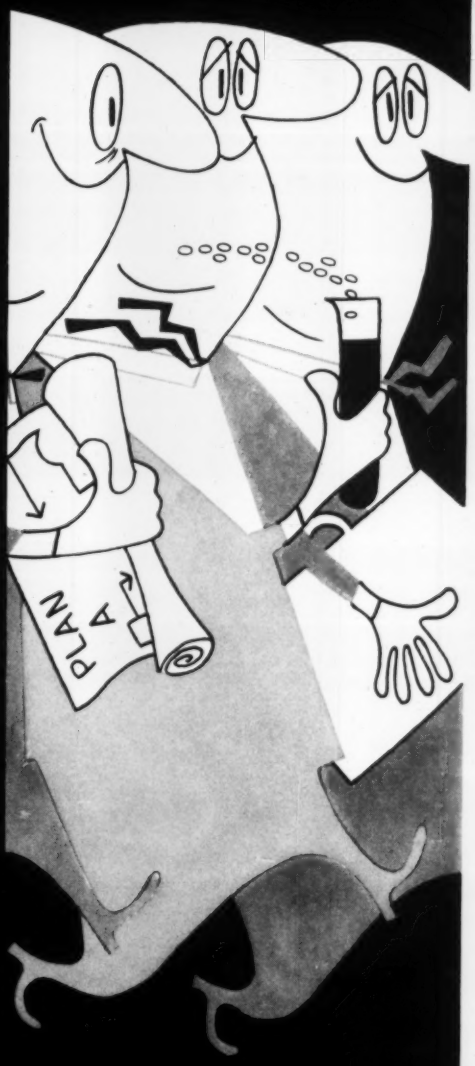
JULY 13, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



Most Steel Consumers Ready for Any Development in Labor Dispute

Senate Unit to Study Depreciation

Labor Seeks More Job Security

How to Maintain and Certify Heat Treat Furnace Controls

Pneumatics Solve Sticky Problem

THE BOOM BEGINS . . .

New STEEL survey of capital equipment spending plans shows: 1959's second half will bring near record outlays by the metalworking industries.

COMPLETE CONTENTS
SAME PAGE

METALWORKING OUTLOOK
PAGE 41

Keeping Technological Pace

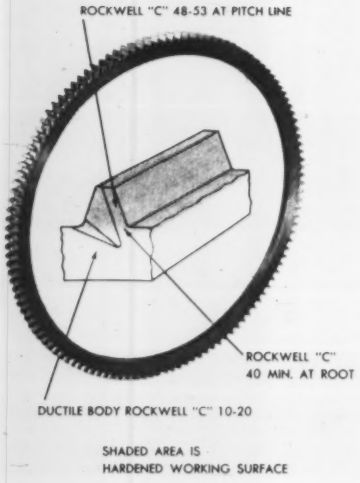
It's the responsibility of all managers, not just R&D people. If you don't keep pace, your company is a potential victim of today's galloping technology. For tips on how to do it and what others are doing, see Page 95.

A PROGRAM FOR MANAGEMENT 1959 . . . No. 6

To the Outboard Motor Industry

on its

At the end of its first half century the outdoor motor industry can regard its "family of fans" with pride—all 35,000,000 of them. Today almost 25% of this nation's population find fun, recreation, even employment in outboard powered craft.



DOUBLE DIAMOND'S CONTRIBUTION

Major makers of electric-starting outboards come to Automotive Gear for their flywheel starter gear requirements. They receive our extensive experience in making millions of them for the automotive field—plus skilled engineering aid—plus respect for their specifications—plus localized hardening for better, longer gear performance—plus good delivery.

If you are powering a product, why not talk to the company that specializes in power transmission via gears of many types? An engineer will respond to your inquiry.

EATON

AUTOMOTIVE GEAR DIVISION

RICHMOND, INDIANA

GEARS FOR AUTOMOTIVE, FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS
GEAR-MAKERS TO LEADING MANUFACTURERS

This Week in STEEL

The Metalworking Weekly

July 13, 1959 Vol 145—No. 2

Metalworking Outlook, Page 43

The Editor's Views—Buy It: You're Paying for It 49
▶ Most Steel Consumers Ready for Any Labor Development 51
Steel Imports Hit Record 360,000 Tons in April 52
▶ Senate Small Business Subcommittees to Study Depreciation .. 53
Raising the Roof in Russia—How dome was built for U. S. show 55
▶ BOOM BEGINS in Metalworking's Capital Equipment Spending 56
First of a series of ten articles based on a new STEEL study
Domestic Manganese Program Falters—Hearing points up peril 63
▶ The Why, How of Labor's Quest for Job Security 66
Western Europe's Steel Output, Trade Drop 67
Granite City Steel Launches Another Expansion Program 82
▶ Keeping Pace with Technology—It's your responsibility 95
No. 6 in STEEL's 1959 Program for Management

Technical Outlook, Page 105

▶ How to Maintain and Certify Heat Treat Furnace Controls 106
▶ Pneumatic Conveyors Solve Problem in Taconite Processing .. 108
Costly Aluminum Plates Reclaimed by Belt Grinder 110
Steel Shells Are Made in a Single Draw—More parts faster 111
Machine Topics—System Is Shortcut for Short Run Piercing .. 112
Progress in Steelmaking—Getting More from Your Computers .. 114
Dolomite Thrower Takes on New Job—Repairs furnace bottoms 116
Descaler Improves Quality of Forged Well Rods 118
Small Machine Reaps Big Payoff—Frees bigger counterparts .. 121

Market Outlook, Page 137

Complete Index to Market News and Prices 137
Turnings Sellers Seek Wider Market—Blast furnaces pace use .. 138
Iron Ore Statistics for May 139
Steelworks operation chart and district ingot rates 140
Monthly Steel Shipment Record Set During May 140
Scrap Prices Displaying Strength—Up sharply at several points 152
Nonferrous Metals—Odds Good for Labor Peace 156

▶ Articles listed on cover.

WHERE TO FIND

Metalworking Pulse . .	Turn Page	The Business Trend	73
Reader Service Center	5	Men of Industry	77
Calendar of Meetings	10	Obituaries	80
Editorial & Business Staffs	16	New Products	125
Windows of Washington .	60	New Literature	134
Mirrors of Motordom	69	Advertising Index	161

Index available semiannually.

STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED JULY 4	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	156†	173	172	115

†Preliminary.

Wildcat strikes in steel, the annual vacation for coal miners, a seamen's strike on the Great Lakes, and the Fourth of July all took their toll from STEEL's index, plunging it to the lowest point in over six months.

Details on Page 73

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED JULY 11	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	122,000* *Estimated.	108,329† †Preliminary.	127,029	73,062

Chrysler Corp.'s Imperial Div. became the first auto facility to phase out its 1959 model production. Other Chrysler divisions will follow suit in the week beginning July 20. But over-all production in July will remain near the first half rate.

Details on Page 70

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED JULY 12	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	2,336*	2,215	2,604	1,442
Index (1947-49=100)	145.4*	137.9	162.1	89.2
Percentage of capacity	82.5*	78.2	92.0	53.4

*Estimated by STEEL; comparative figures reported by AISI.

Steelmakers lifted operations a few points last week. They sank in the previous week to lowest level since January. Causes: Chiefly wildcat strikes and holiday curtailments.

Details on Page 140

STEEL SCRAP PRICE COMPOSITE

	JULY 8	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$38.00	$36.83	$35.50	$35.83

Prices rose sharply at several points last week. Main reasons: 1. Growing confidence that a strike will be averted. 2. Supply of industrial grades will taper as fabricators take vacations. 3. Export demand remains heavy.

Details on Page 152

FINISHED STEEL PRICE INDEX

	JULY 7	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	181.5

Firmness of the market continues. Counteracting active demand for all products are sustained pressure from imports, which are setting all-time highs, and possibility of higher production costs.

Details on Page 141

Special Fasteners

Bethlehem makes the widest variety. Those you see here are just a small sample of the steel specialties we can produce. And our fasteners engineers will help you design products, whether they are headed, threaded, slotted or pointed. Try us. Our Lebanon, Pa., plant is geared to turn out your order fast.

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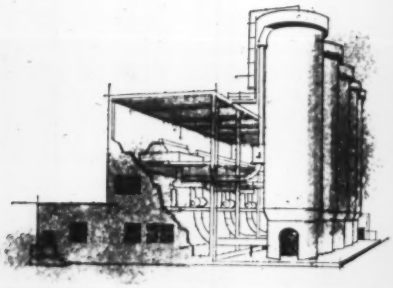
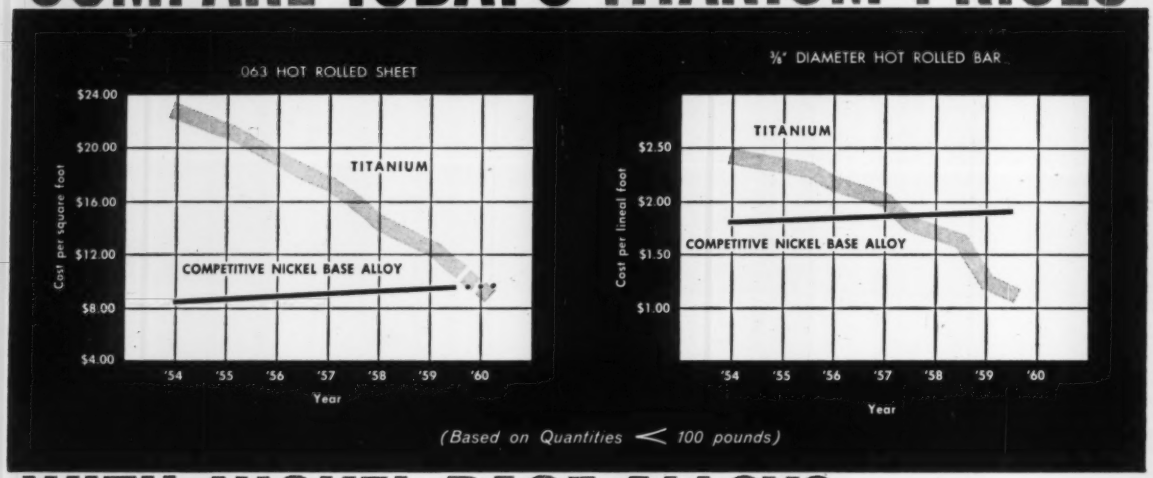
BETHLEHEM STEEL

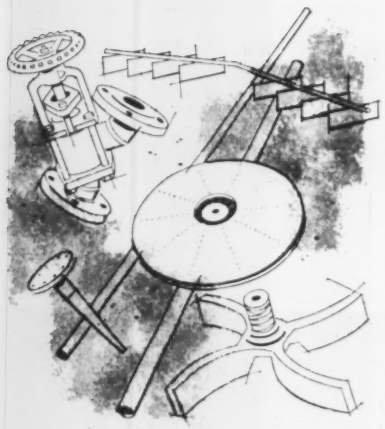
BETHLEHEM STEEL



COMPARE TODAY'S TITANIUM PRICES



WITH NICKEL BASE ALLOYS



Write for *Technical Data Sheets on "Cost Cutting Ideas in Titanium" for:*
- *The Pulp and Paper Industry*
- *Chemical Valves, Pumps and Accessories*
- *Metal Treating Applications*

Address: Commercial Market Development, Department C, Mallory-Sharon Metals Corporation, Niles, Ohio.

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A 52% price reduction has already been realized in the last five years. And the best part of it is that Titanium prices can be expected to go still lower while other metals will probably increase in price.

This will be possible because of improved melting practice and rolling techniques, plus increased production as more and more users become familiar with Titanium's corrosion-proof characteristics, increased service life, and reduced downtime advantages.

Mallory-Sharon will gladly work with you in designing Titanium into your products or applications and will be pleased to show your production men how easy it is to form, machine, weld or fabricate Mallory-Sharon Titanium.

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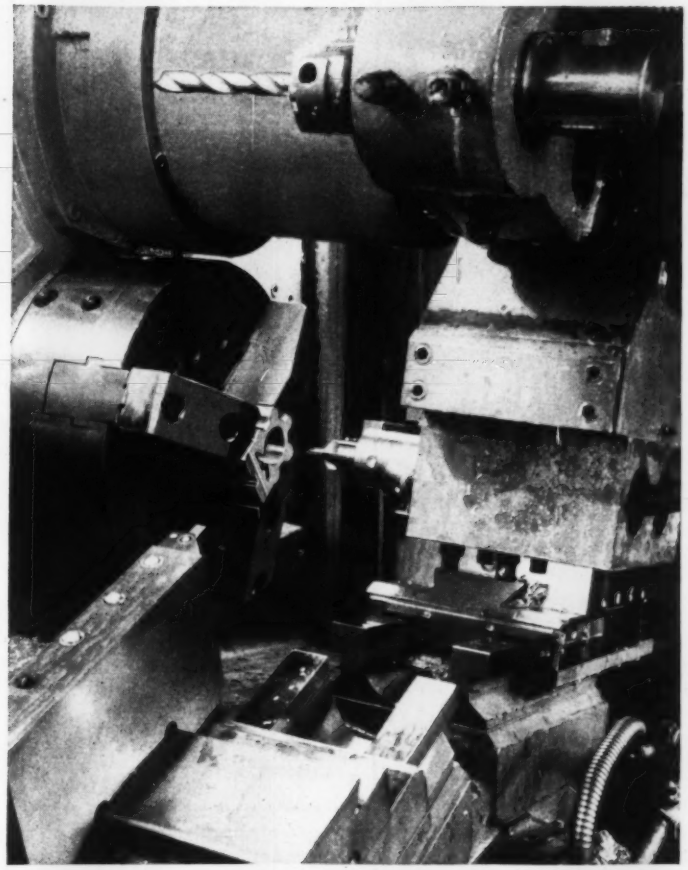

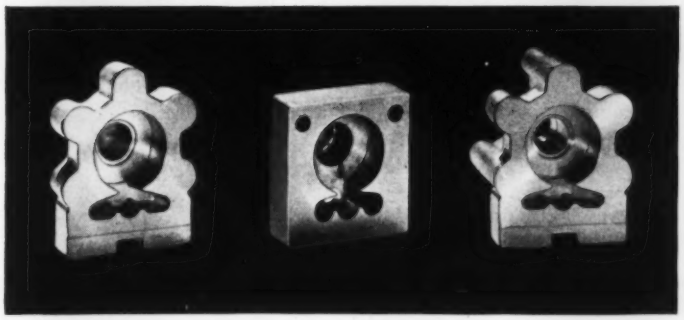

Eco's Warner and Swasey 2AC Chucking Automatics give the chemical process industry, for the first time, a wide selection of standard stock pumps at production prices. Formerly, high-cost custom-built units were always used.

The Eco pumping unit used to fuel the Vanguard II Rocket requires precision machining of nickel alloy materials and austenitic stainless steels—both extremely difficult to machine because of their work-hardening characteristics.

To assure good fit, long life and freedom from vibration, components are machined on the Warner & Swaseys to tolerances as low as .0005". Formerly Eco roughed out pump bodies on turret lathes and then finished to the necessary close tolerances on specialized finishing equipment.

The Warner & Swasey 2ACs handle all operations at production rates 3 to 10 times faster than previously.

Call in a Warner & Swasey Field Engineer for the production and profit facts on these versatile Automatic Chuckers.

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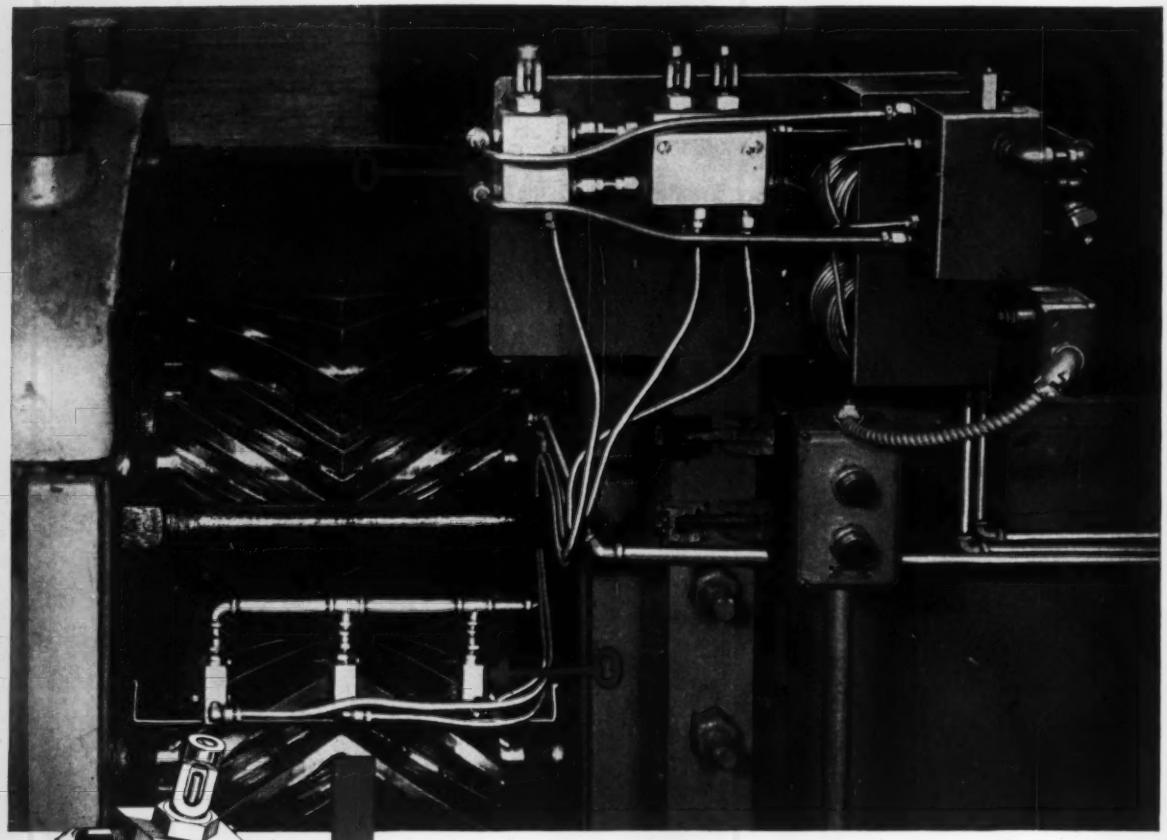

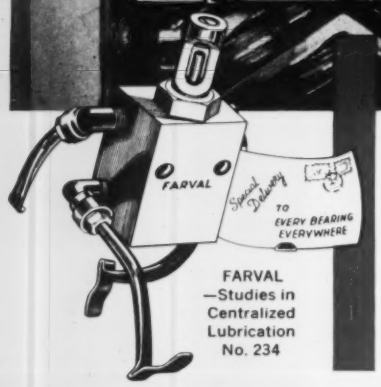

FARVAL
—Studies in
Centralized
Lubrication
No. 234

$715.00 savings in one year paid for this automatic Farval Spray System

In this prominent brass manufacturing plant, herringbone gears for the hot commutator roll presented an acute lubrication problem. Manual lubrication procedures were inefficient, costly, and used excessive lubricant. Also, poor housekeeping – due to equipment being covered with wasted lubricant – was reflected in a high clean-up labor cost.

A modern Farval Spray Valve Lubrication System was installed and immediately solved the problems. Now the plant's operators report:

- Reduction of 84% in amount of lubricant formerly required
- Exactly measured amounts of lubricant are automatically delivered at six-minute intervals – eliminates the need for workmen to go near meshing gears
- Since installation of Farval, no maintenance has been required
- Housekeeping is no longer a problem – leakage and wasted lubricant have been entirely eliminated

Check with your Farval Representative and get the complete story on how these modern, automatic, centralized lubrication systems can improve your production operations – cut over-all costs, too. Or, write for free Bulletin 60-A.

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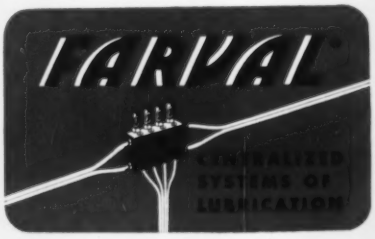
KEYS TO ADEQUATE LUBRICATION

—wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.



Fan Mail for Acton

F. F. Loock, president, Allen-Bradley Co., Milwaukee writes: "We would like 200 reprints of 'The Case of the Vanishing Jobs' and of 'The Case of the Vanishing Taxes.' These are excellent articles and we are sending a set to each of our salesmen . . .

"Among the purchasing fraternity, there are many people who do not understand the import of this situation. They are interested only in low prices. I had one 'chief purchasing agent' write—in connection with a price increase made by the control industry—that he looks to the time when our industry will be given competition by European controls. He felt that American industry deserves to be 'taken down' a peg or two or three. Evidently, he is of the opinion that his advantage in buying foreign material will not make itself felt—at least eventually—on his income."

Another Quarter Heard from

In our June 15 issue, Editor-in-Chief Irwin Such explored how American companies could meet foreign competition. W. F. Stoeffhaas, executive vice president and general manager, Arnold, Schwinn & Co., Chicago, notes: "I disagree with your editorial.

"I have been chairman of the bicycle industry's Tariff Committee for ten years. As you know, our industry has been plagued with low-priced foreign competition for many years and is suffering the loss of 30 per cent of its market. The profits on the 70 per cent which we have been able to retain are practically nonexistent because of the pressure exerted by imports. I am convinced there are only two ways to meet foreign competition:

1. Do what every country in the world does (except the USA), give complete protection to domestic industry on every product which is produced in that country. 2. Reduce the standard of living. Remember—'Anything we can do, they can do cheaper.' "

The Editors Believe . . .

That artificial restraints on trade are not answers, only expedients. The problems to be attacked: The narrowing margin of technical supremacy and the wide disparity in wage costs between domestic and foreign firms. What's needed? Constructive tax revisions. Depreciation reform measures. Wages held in line. Increased productivity. Careful material selection. Improved engineering. Skillful marketing. New and better products and facilities.

Those are some of our solutions. What are yours?

We Switched Horses

Labor developments in steel, aluminum, and copper made a liar of us in the June 29 issue. (We sounded the trumpets for a series of articles on job security to start July 6.) As is our policy, spot news was given priority over a planned story. So the job security story begins in this issue (Page 66).

Welding's Heated Battle

The gentleman emphasizing a point is Ross Whitehead, associate editor of STEEL who has a lot of welding knowhow. The listener is longtime welding authority, James F. Lincoln, chairman of Lincoln Electric Co., Cleveland.

The subject: Welding tests. Welding is jampacked with them. Ultrasonic and x-ray are becoming as common as visual and mechanical tests. How important they are is controversial. Some people seem impressed by weldment failures. (Welds that crack in subzero weather, for example, cause some people to espouse testing.)

Yet most welding is on mild steel and the welds frequently outlast the product's useful life—Office chairs, children's scooters, and countless

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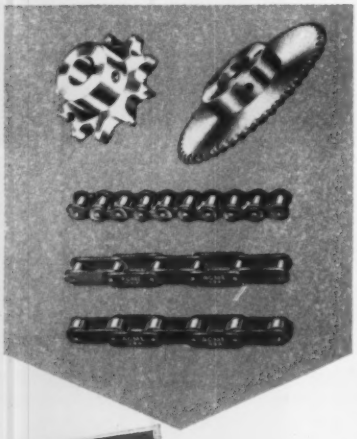

Write Dept.10-H for new 100-page Illustrated Catalog, including new engineering section showing diagrams of 36 methods of chain driving.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

items are in that category.

Ross discussed those factors with Mr. Lincoln and other welding authorities, a baker's dozen, who contributed to next week's controversial article: "Are Too Many Tests Hurting Welding?"

The Reader Follows up

Kenyon D. Love, executive vice president and secretary of Colonial Foundry Co., Louisville, Ohio, follows up on his comments in this column June 22 (on the need for theoretical work by foundrymen): "Math, physics, and other departments in universities do graduate work on a theoretical basis and have no interest in applications. In various practical engineering fields, applications are the rule for graduate study. There ought to be more overlap.

"Small business executives, interested in advancing their industries, have to advance their own education. Busy executives have to take shortcuts. It may not be orthodox, but why shouldn't they be permitted to take part in fundamental, theoretical investigations? Edison learned 9000 ways not to make a light bulb and in the process is credited with having discovered the 'Edison Effect.' Observations made to advance the fundamental and theoretical can and should accompany applications research. Encourage duality of purpose and the research budget will provide a greater yield."

Does the Ivy Need Mulching?

Reader Love continues: "There are about 76 institutions in the U. S. providing graduate work for Ph.Ds in scientific fields. All require the work be done in residence. None may be done by correspondence, and part-time graduate work is greatly discouraged. What can be done about it?"

Reader Love is interested in advancing his industry's art and his personal knowledge. Many executives are plagued with related problems. Here's a quotation from Chicago Editor Bill Dean's Program for Management article, "Keeping Pace with Technology":

"If you rely only on experience, you'll be doing tomorrow's job with yesterday's technology." The two biggest obstacles to keeping pace: "I just don't have time." "We can't afford the manpower and facilities it would take to do a complete job."

Some answers to these plaints are in Bill's article on Pages 95-102. We don't have all the answers.

Do you have any?

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Continuous movement of products through heat-treating operations, as well as quenching, washing and drying, speeds up production and cuts costly manual handling.

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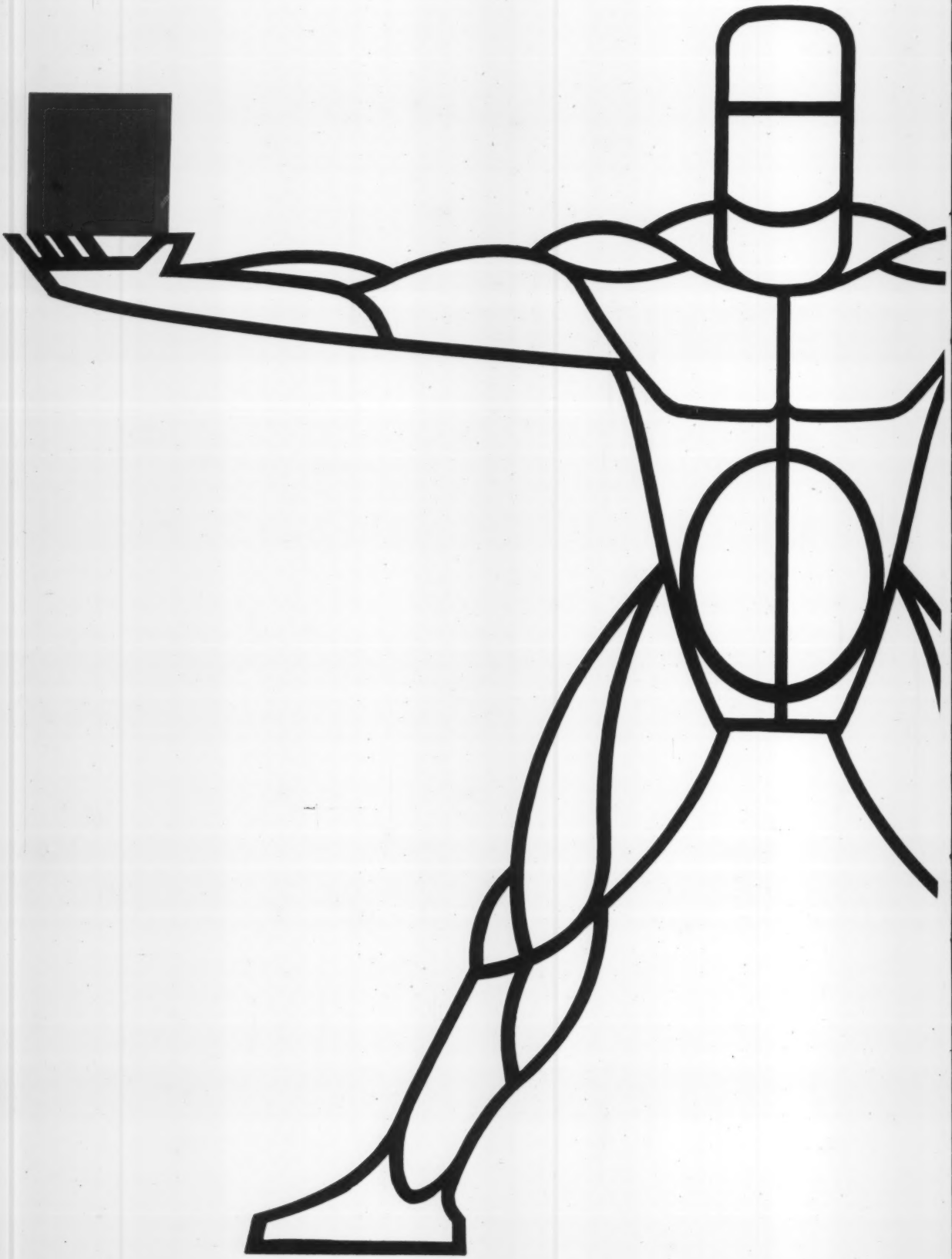
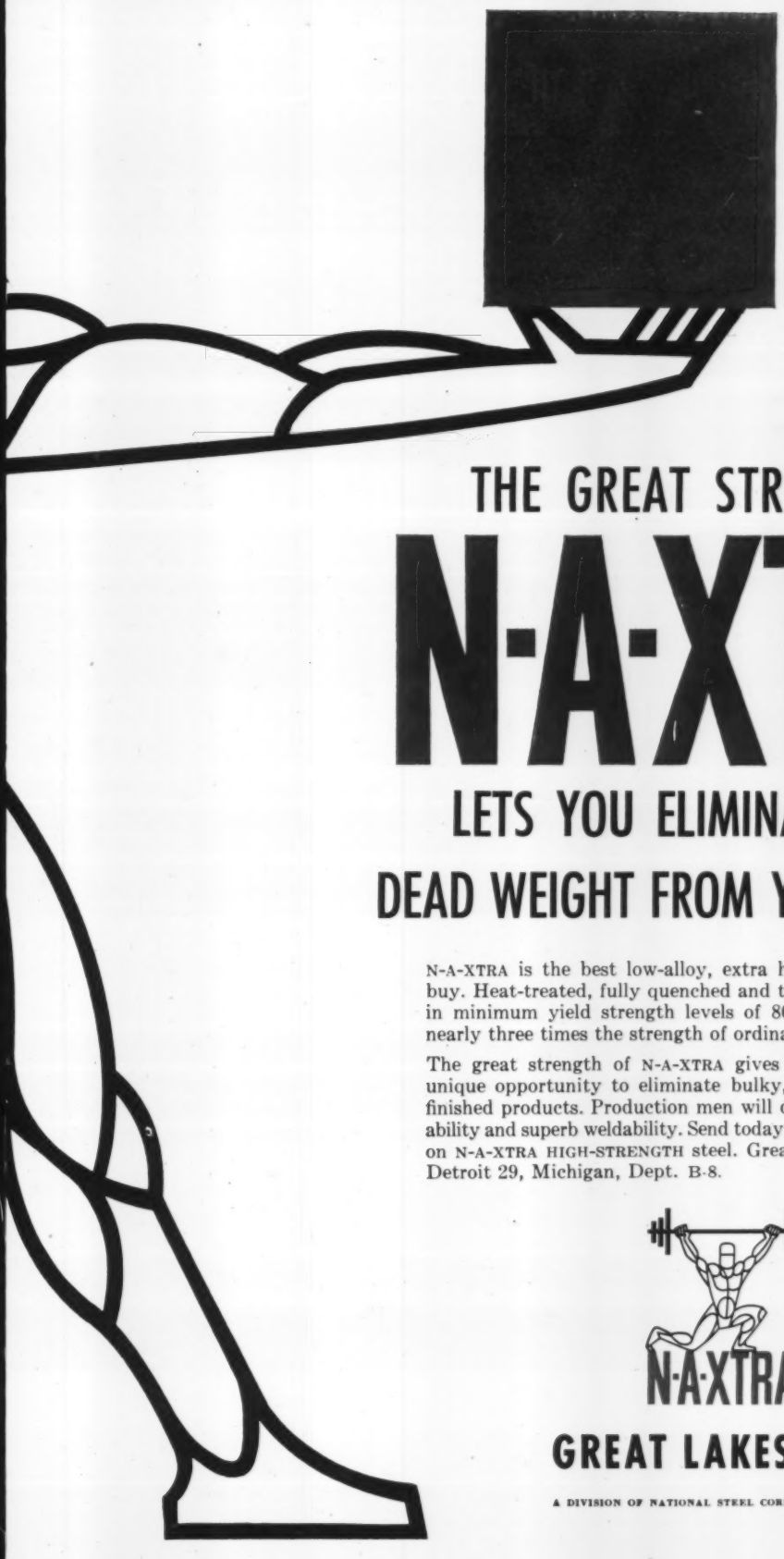


STEEL



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N-A-XTRA is the best low-alloy, extra high-strength steel you can buy. Heat-treated, fully quenched and tempered, it's now available in minimum yield strength levels of 80,000—110,000 psi. This is nearly three times the strength of ordinary carbon steel.

The great strength of N-A-XTRA gives engineers and designers a unique opportunity to eliminate bulky, useless dead weight from finished products. Production men will delight in its superior formability and superb weldability. Send today for our illustrated brochure on N-A-XTRA HIGH-STRENGTH steel. Great Lakes Steel Corporation, Detroit 29, Michigan, Dept. B-8.

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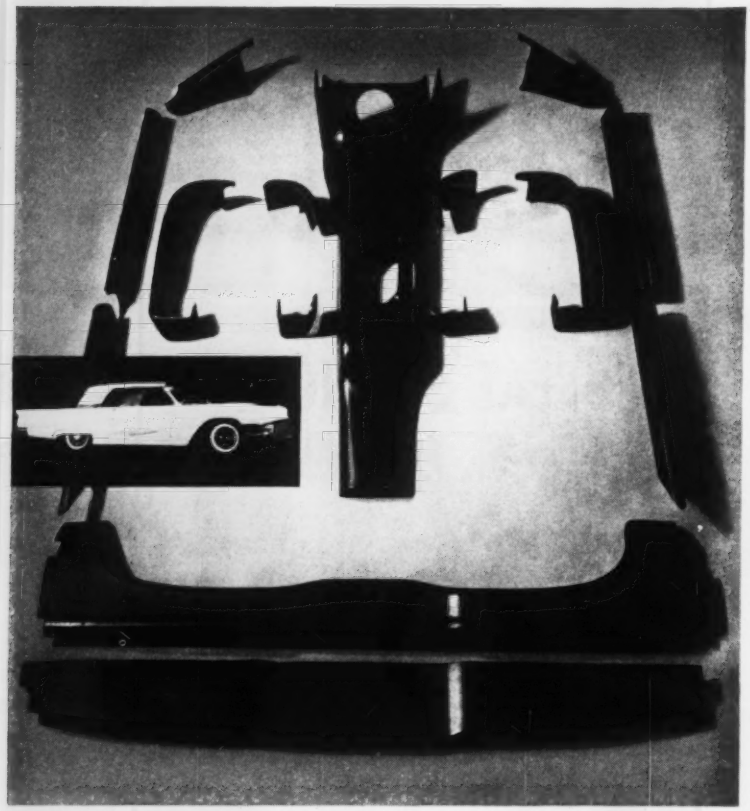
Thunderbird interior high-styled with Colovin vinyl-on-steel laminate



For second year, Ford specifies Colovin over other vinyl-coated materials to create luxurious leather texture and exact color match

Door panels, window mouldings, instrument panel extensions, package tray, bucket seat mouldings, control "console" — the entire interior of the '59 Thunderbird presents an uninterrupted flow of luxurious leather-grained vinyl.

To achieve this effect, Ford subjected a number of materials to rigid testing. Only Colovin filled Styling's requirements of deep-texture embossing and exact color matching of upholstery, laminated parts and painted surfaces.

Colovin laminate also met every Engineering specification. It is machined to precise tolerances on standard equipment. It requires no finishing, painting or costly hand operations. In stamping, the vinyl surface acts as a natural lubricant.

Get the whole story in "Colovin Meets Metal." Laminate samples, colors and textures, test specifications, industrial applications, and a list of laminators to whom we supply Colovin vinyl sheeting. Mail coupon for copy.

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CALENDAR
OF MEETINGS

July 13-15, Truck-Trailer Manufacturers Association: Semiannual meeting, Homestead Hotel, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Executive manager: John B. Hulse.

July 29-Aug. 1, National Tool & Die Manufacturers Association: Summer board meeting, Grand Hotel, Mackinac Island, Mich. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Aug. 10-13, Society of Automotive Engineers: National west coast meeting, Hotel Georgia, Vancouver, B. C. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 18-21, Western Electronic Show and Convention: Cow Palace, San Francisco. Information: WESCON, 1435 S. La Cienega Blvd., Los Angeles 35, Calif.

Aug. 19-20, National Screw Machine Products Association: Sales conference, Wade Park Manor Hotel, Cleveland. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

Aug. 31-Sept. 2, Metallurgical Society of AIME: Institute of Metals Division's conference on semiconductors, Statler-Hilton Hotel, Boston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Sept. 13-17, Pressed Metal Institute: Annual meeting, Stanley Hotel, Estes Park, Colo. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

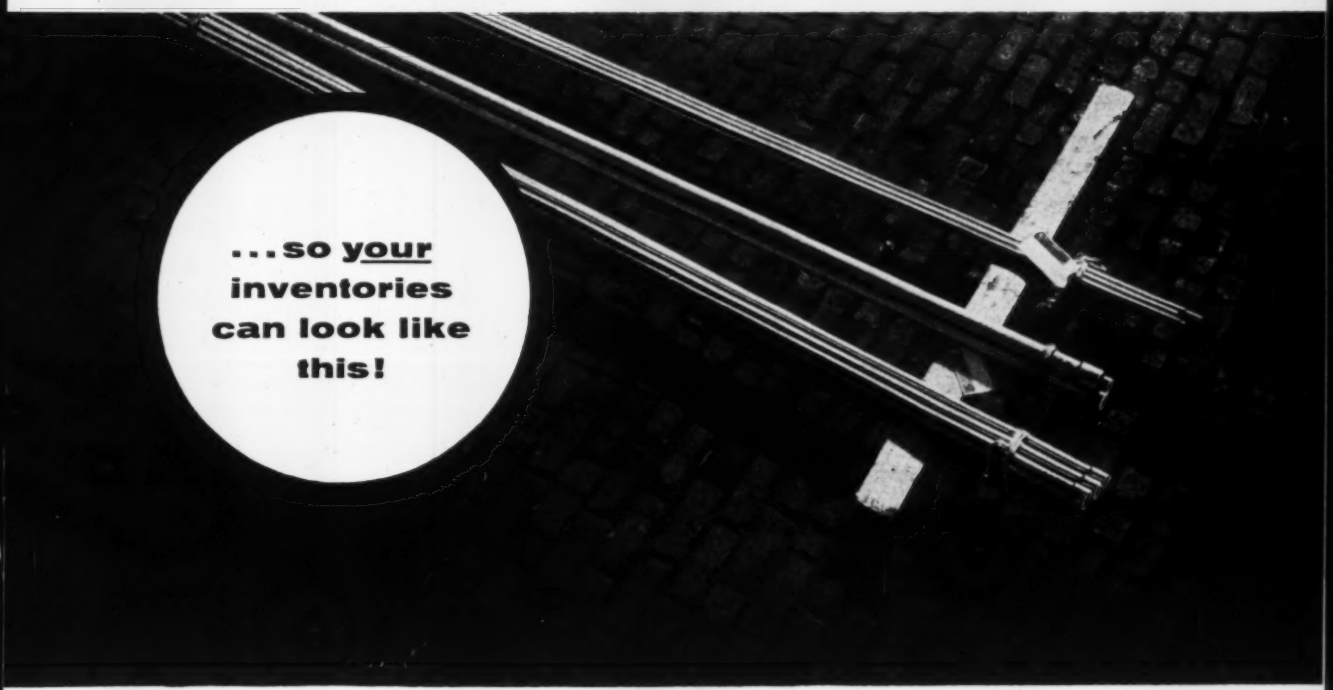
Sept. 13-18, American Chemical Society: Fall meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N. W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 14-17, Society of Automotive Engineers: National farm, construction and industrial machinery meeting, production forum, and display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 14-17, American Mining Congress: Metal Mining and Industrial Minerals Convention, Denver. Congress' address: Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

Sept. 16-17, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Photos courtesy of The Geo. Worthington Company



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Youngstown, Ohio

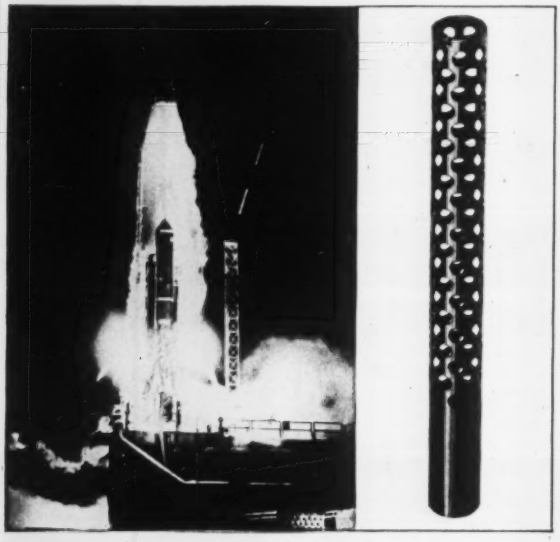
Manufacturers of Carbon, Alloy and Yoloy Steel

BISHOP Tubular Products NEWS

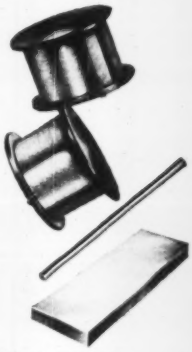
"METALS FOR PRECISION AND PERFORMANCE"

BISHOP QUICK SERVICE TEAM SOLVES STICKLER IN ATLAS PROGRAM

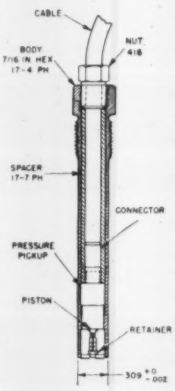
Telemetering bulb part (illustrated)—originally of 304 seamless tubing—cracked during fabrication. BISHOP specialists were called in—304L seamless, ½ hard was recommended and supplied (against a tough deadline). *Results:* The 304L part met all requirements, including critical resistance to vibration fatigue within a temperature range of −80° to −380°F in inert helium, and gave completely satisfactory performance in the Atlas program. More information on 304L—or any BISHOP tubular products? Use the coupon.



BIMETALLICS NOW AVAILABLE IN MANY DIFFERENT FORMS, METALS



Bimetallics—the new family of composite metal products—is solving problem after problem these days. BISHOP capabilities in producing bimetallics are almost endless. Both *base* and *precious* metals are available in wire, sheet, and tubing form. *Typical example of popular bimetallic for glass sealing applications:* nickel-iron alloys over copper wire in sizes from .004 to .125 in. diameter . . . advantages: *low* electrical resistivity, *good* thermal conductivity. Look into the possibilities of improving *your* products . . . use the coupon.



17-7 PH* TUBING BEING DRAWN TO HYPODERMIC SIZE

Small diameter 17-7 PH tubing, welded and seamless, is available from BISHOP now on standard order in sizes down to .375 in. OD X .035 in. wall—on special order to .020 in. OD X .006 in. wall. Accompanying illustration shows a piezoelectric transducer used for measuring pressures up to 100,000 psi in ballistics and hypersonic research work. Use of welded 17-7 PH spacer in transducer permitted finish machining of the part *before* heat treating. Want more data on BISHOP'S 17-7 PH products or other super alloys? Use the coupon.

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J. BISHOP & CO.

platinum works

FOR HELPFUL DATA USE THIS HANDY COUPON

Check information you'd like and mail to J. BISHOP & CO., 30 King St., Malvern, Penna.

- ☐ **Bimetallics,** Data Sheet PA-1
- ☐ **17-7 PH alloy,** Data Sheet TA-2A
- ☐ **304L alloy,** Data Sheet TA-2
- ☐ **Tubular Products,** Bulletin No. 12
- ☐ **Platinum Metals Products,** Catalog No. 3

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Products of all the Platinum Metals... Small diameter Stainless Steel, nickel and special alloy tubing

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Don't settle for "second-best" when the best may cost you less! Chances are whatever your needs in an inclinable, it's a Bliss standard—simply because Bliss makes more types and sizes of inclinable presses than any other builder. In fact, someone else's "special" may be a Bliss standard. Check it out for yourself before you buy—write for our most recent inclinable catalogs and data sheets. You'll see that size for size, no matter what you want in an inclinable, you get more press from Bliss ... large crankpins, long strokes, greater openings, bigger beds and many other extra values. A press that's backed by a century of press engineering ... by competent counsel ... by a **dependable** parts and service program. In short, you'd be wise to check Bliss—**first!**

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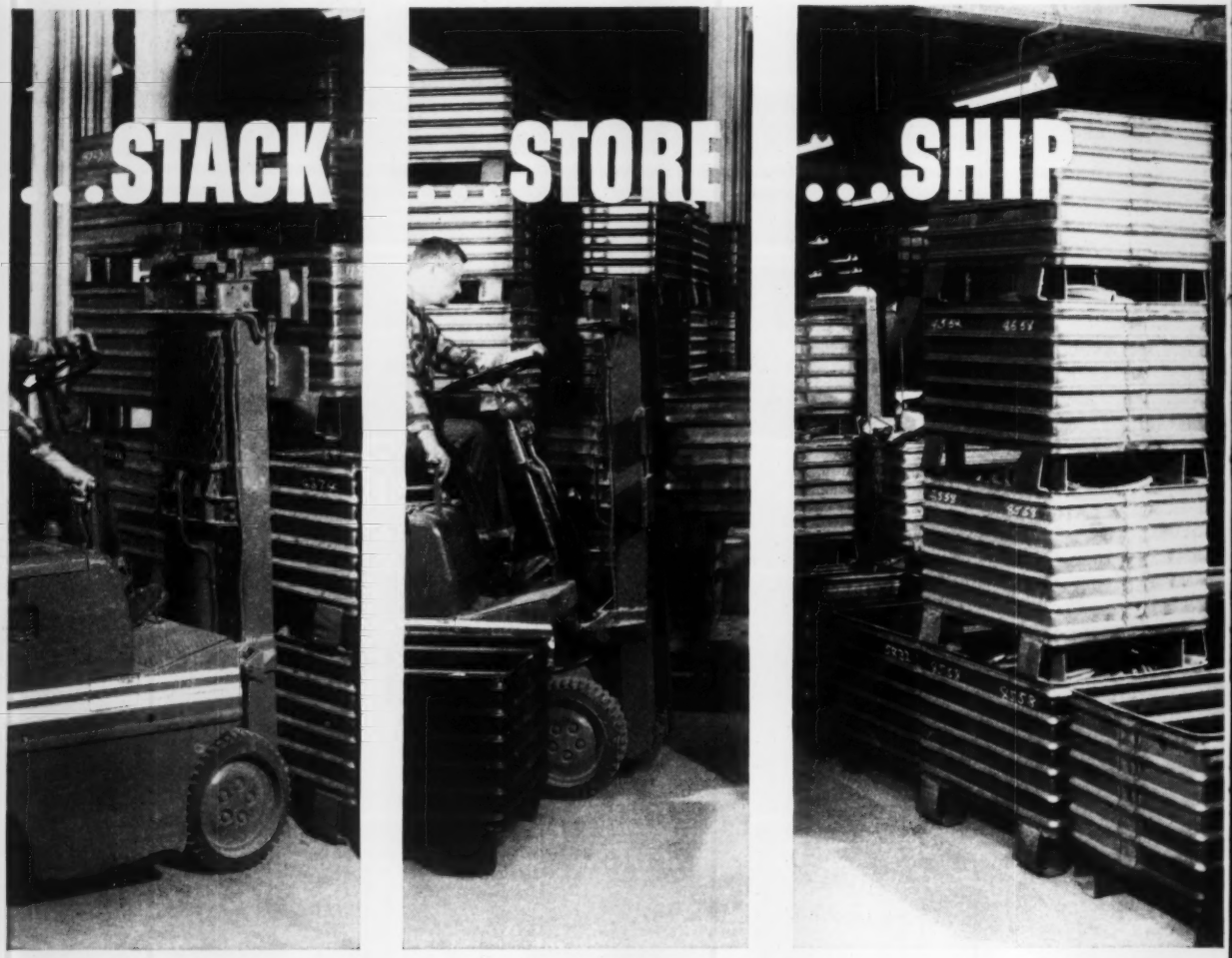

REPUBLIC MATERIALS HANDLING EQUIPMENT... saves time at Signode Steel Strapping

680 Republic Stacking Boxes in use and more on order!

The Signode Steel Strapping Company, Glenview, Illinois, makes good use of these rugged boxes in the production of stretchers, sealers, cutters, power strapping machines, and seals. Signode, largest producer of such equipment in the U.S., knows that Republic Stacking Boxes speed materials handling while greatly reducing storage area requirements.

At Signode, boxes are filled with finished parts and stacked high awaiting production assembly or shipment. Stacking does not damage the boxes. Heavy-duty stacking brackets and corrugated box construction deliver long, efficient service at low per-year cost. In addition, four-way fork channels simplify handling in restricted space. Smooth flange around the top eliminates sharp edges.

Let the materials handling engineers of Republic's Berger Division work with you in solving your materials handling problems. Like Signode Steel Strapping, you'll find there are many new ways to save time, money, and storage space in your plant. Call your Republic representative or write direct.

REPUBLIC STEEL LOCKERS offer clean, attractive, dress-wash-change facilities. Interiors are spacious, well designed for convenience and ventilation. Bonderized to resist rust, retard corrosion, and provide better paint adhesion. Finish is baked enamel. Positive locking and heavy-duty steel construction assure protection of personal effects and tools. Made of steel, strong and sturdy. Attractive design. Mail coupon for data, prices, and delivery.

REPUBLIC METAL LUMBER® meets in-plant framing needs quickly, easily, and economically. Unique pattern of short slots allows complete flexibility and assures sufficient bolts in bearing to give adequate joint strength. Bonderized and finished in baked enamel after fabrication. Convenient bundles of 10 pieces, 10- and 12-foot lengths, bolts included. Simply plan, cut, and bolt to get the job done the new METAL LUMBER way. Send for complete details.

MATERIALS HANDLING EQUIPMENT FOR THE TEXTILE INDUSTRY reduces the problem of handling, transporting, and storing bolts of cloth. Open-end construction permits easy access to bolts. Offset channels under each unit permit tiering to any practical height, save space. Rugged, corrugated construction assures long, efficient life at lowest per-year cost. And, four-way fork channels simplify handling. Mail coupon for additional information.

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Do you know that many cancers can be cured if detected early? That an annual health checkup is your best protection against cancer?

Are you giving yourself this big advantage? Or are you taking chances with your life because of foolish attitudes about cancer like these?

DON'T EVEN MENTION THAT WORD!

Fear keeps some people from even *learning* cancer facts that can save their lives.

NEVER FELT BETTER!

Checkups help to detect cancer in its "silent" stage before you notice any symptom.

COSTS TOO MUCH!

Dollars you spend for the protection of your health can mean years of life.

Millions of Americans have made an annual checkup a habit... *for life.* How about you?

AMERICAN CANCER SOCIETY

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Equally important to you — P&H is the *only* crane manufacturer that makes the *entire* crane . . . including all structural, mechanical, and electrical parts . . . and then gives you guaranteed one source responsibility. *Remember that* . . . the next time you buy a crane on which your mill production will depend! For more information, write for Bulletin C-42, Dept. 107, Harnischfeger Corp., Milwaukee 46, Wisconsin.

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OUR 75TH YEAR

TOMORROW'S NEWS GETS A "LIFT" FROM P&H

The newspaper must go out on time! And to start heavy rolls of newsprint into production, this major metropolitan daily relies on the finest hoists in the world to keep things moving . . . new Balanced-Design P&H Hevi-Lifts.

Balanced Design means that each part of the new P&H Hevi-Lift hoist has been balanced or matched with every other part for maximum strength, temperature, and performance characteristics. *There are no weak parts!*

Even under severe duty cycles — motor, gearing and brakes continue to function at top efficiency without excess heating or abnormal wear. In short, *Balanced-Design Hevi-Lifts will stand up longer under heavier duty cycles — with less maintenance — than any other hoist made today!*

If you can't afford "second chances" in your materials handling, write today for Bulletin H-55 and take a long look at the complete line of Balanced-Design P&H Hevi-Lifts. It's yours for the asking from Dept. 206, Harnischfeger Corp., Milwaukee 46, Wisconsin.

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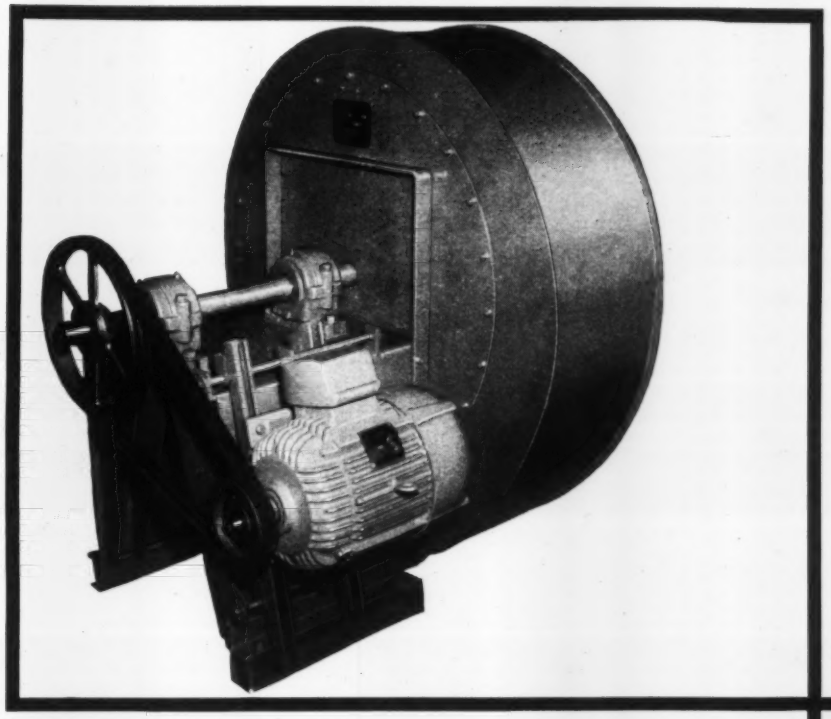
OUR 75TH YEAR

Photo Courtesy New York NEWS



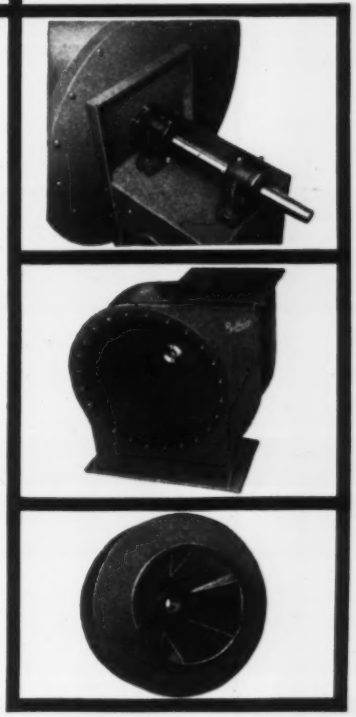
From Rugged Hot Gas Applications To Tough Materials Handling Jobs...

"BUFFALO" EXHAUSTERS CAN TAKE IT!

"Buffalo" Industrial Exhausters are ruggedly built, highly efficient heavy duty fans designed for a wide variety of applications. Husky steel plate housing is welded throughout. Adjustable to any discharge direction. Reversible for clockwise or counter-clockwise rotation. Available in numerous arrangements for many severe air and materials moving jobs. These include:

- **Moving Hot Gases** — 200° F. to 850° F. For this purpose units are equipped with heat slingers, high temperature ball bearings and/or separated steel bearing subbase.
- **Handling Corrosive Fumes.** Installations have proved that "Buffalo" Rubber-Lined Exhausters will outlast metal fans up to twelve to one. Rubber is vulcanized directly to all metal parts exposed to acid fumes.
- **Materials Moving.** Type "MW" material wheels are available for moving emery dust, saw dust, chips, long shavings and many other types of materials.

Investigate the advantages of "Buffalo" Industrial Exhausters for your severe air or materials moving jobs. Phone your "Buffalo" engineering representative, or write for Bulletin FI-110.



Upper: Heat Slinger for cooling shaft and bearings on a "Buffalo" Hot Gas Exhauster.

Center: "Buffalo" Rubber-Lined Exhauster for corrosive fume handling.

Lower: "Buffalo" Type "MW" Material Wheel.

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Buffalo, N. Y.

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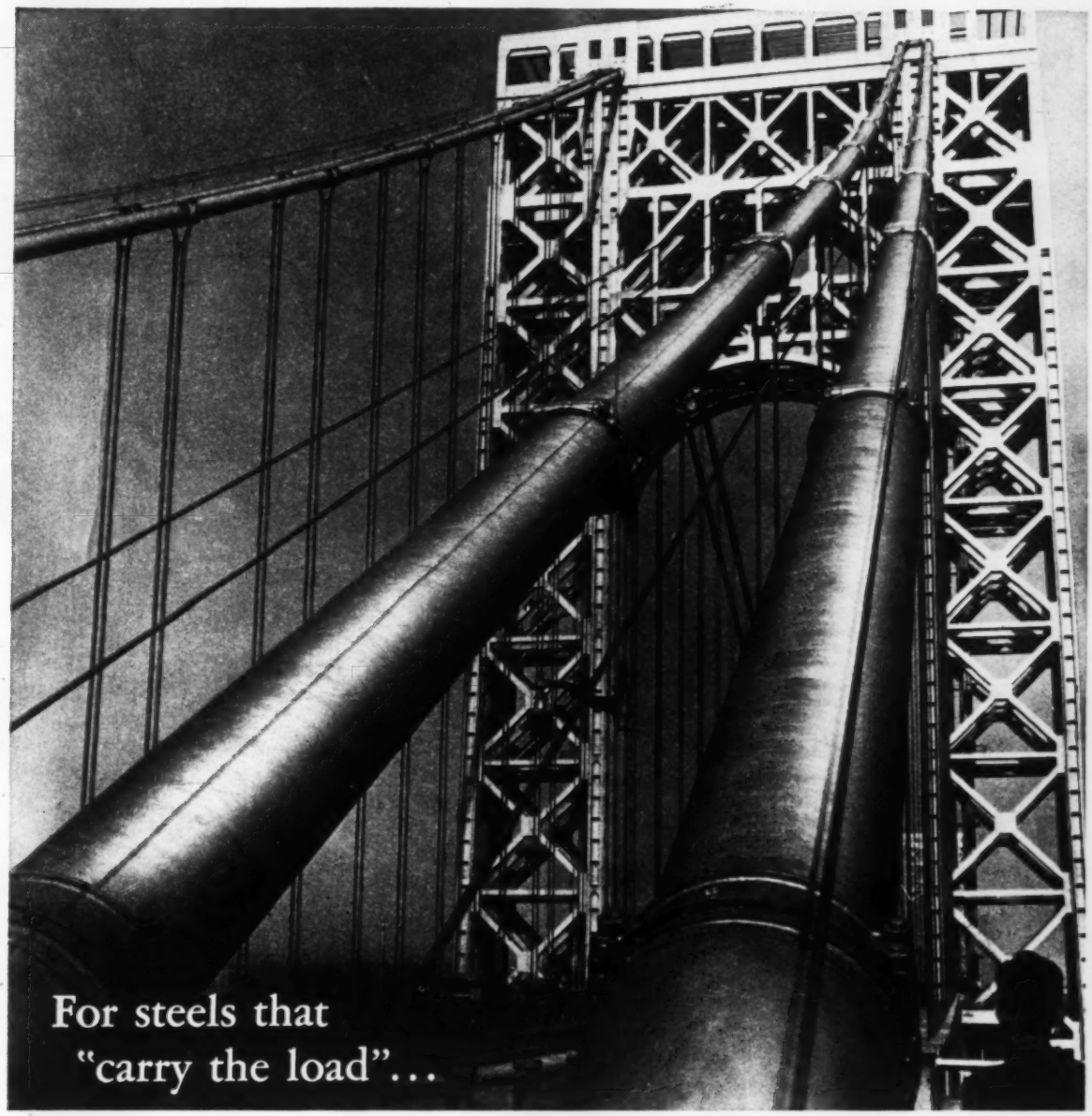

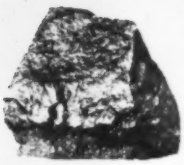

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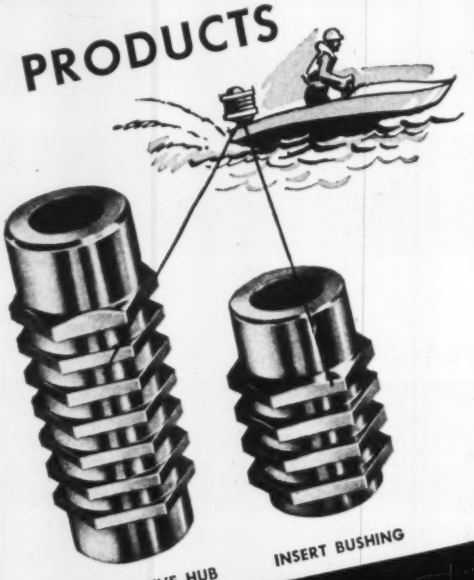
two typical cases where MUELLER BRASS *determined the best and most*

CASE HISTORY 1750

SCREW MACHINE PRODUCTS for outboard motors

Mueller Brass Co. Methods Analysis Engineers, after careful consideration of every aspect of the job requirements, found that the best method of producing these 2 outboard motor parts at the lowest cost was as screw machine products made from hollow hex rod. The insert drive hub and insert bushing are used in the lower units of one of America's most powerful outboards and must absorb constant punishment without failing. Mueller Brass Co. has one of the world's largest automatic screw machine departments fabricating both ferrous and non-ferrous custom parts. Parts can be produced in an infinite variety of shapes and sizes from 1/8" to 3 1/4" in a wide range of free cutting and specialized alloys. Complete facilities are available for all secondary and finishing operations, as well.



INSERT DRIVE HUB

INSERT BUSHING

THE MAN FROM MUELLER BRASS CO.

can give you sound, unbiased advice on the one best method of making your parts because Mueller Brass Co. is the only fabricator in the country offering all these methods of production. An experienced "Methods Analysis Department" has at its command a complete knowledge of the advantages and limitations of each production process. This unique technical service is your assurance of getting the best product at the best price . . . made the one best way.

FORGINGS

PLASTIC INJECTION MOLDING

MUELLER BRASS CO.

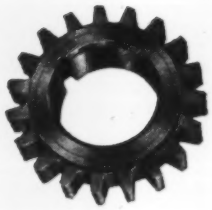
CO. METHODS · ANALYSIS · SERVICE

economical method of producing parts

CASE HISTORY 226

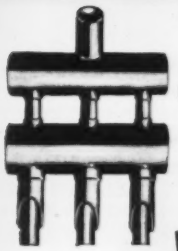
COLD-PREST® IMPACT EXTRUSION for door closer cylinder

By producing this door closer cylinder as a Cold-Prest Impact Extrusion, several important advantages are realized: formerly made in three pieces, the part is now made as one piece in one operation which eliminates machining and assembly operations. The possibility of leakage is eliminated and the part has better physical properties, as well as a smooth, bright finish. Mueller Brass Co. has complete facilities for producing Cold-Prest impact extrusions of aluminum, copper, brass, bronze and steel. Square, rectangular and cylindrical shells up to 28" in length are possible depending on wall thickness and other design details. Parts can be designed having ribs, flutes, splines or bosses . . . with multiple wall diameters and with various wall sections.



POWDERED METAL PARTS

SAND CASTINGS



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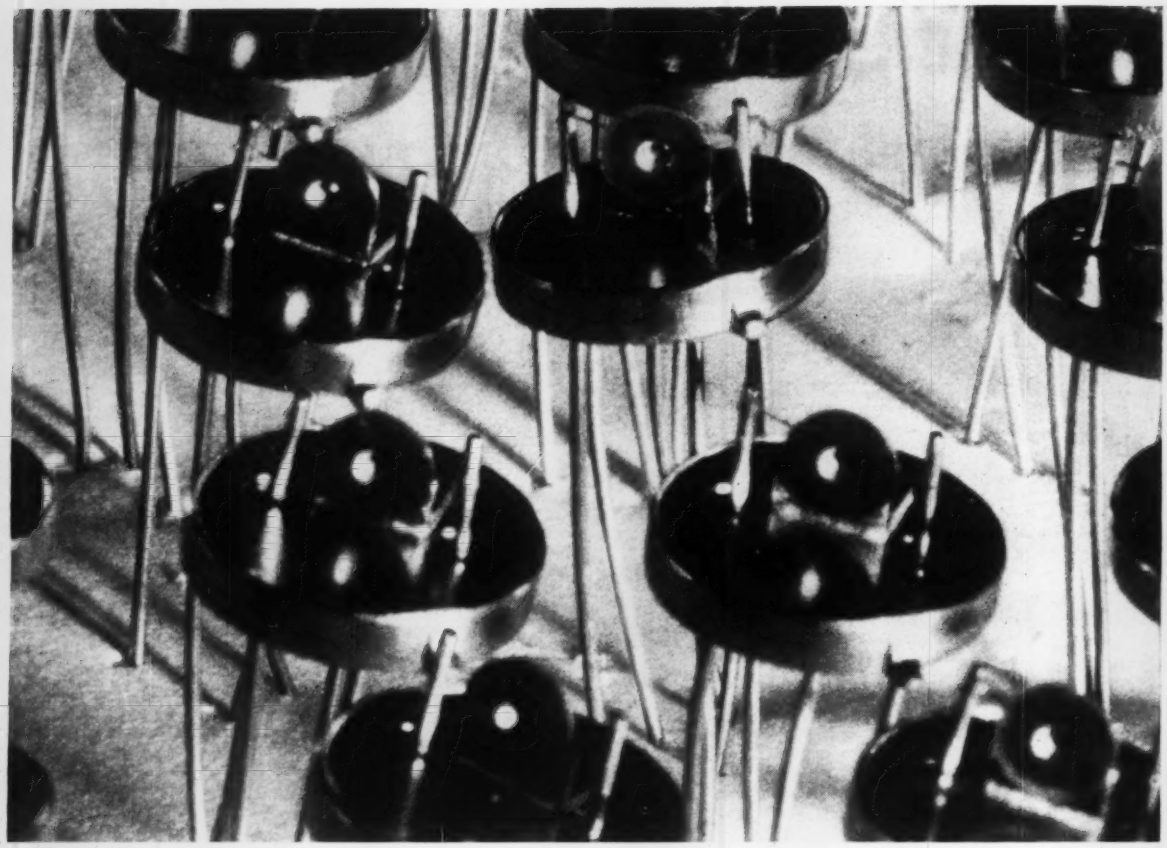
270



IBM, Poughkeepsie, N. Y.: Critical alloying and bonding temperatures determine final operating characteristics of germanium transistors (above).

Alloying and bonding temperatures a problem?

Not at IBM, Poughkeepsie, N. Y., where Speedomax® H is helping alloy the "dots" and bond the "whiskers" in the manufacture of transistors for their data processing equipment. The right alloy and proper bond depend upon temperature . . . determine transistor operating characteristics. At IBM, Speedomax H is holding these critical temperatures to within 2 degrees F . . . reproducing desired processing conditions, again and again. Rugged, compact and thoroughly reliable, this modern controller is providing equally dependable control for many other heat treating processes . . . helping to produce both process economies and a quality product. *Whatever your heat treat, it'll pay you to investigate Speedomax H! For details, contact your nearest L&N office or write 4957 Stenton Ave., Phila. 44, Pa.*

LEEDS Instruments **NORTHRUP** Automatic Controls • Furnaces

Operator loads CM furnace with tray of germanium wafers. Routine check with traveling thermocouple and Speedomax Type G AZAR recorder proves Speedomax H holds temperature gradient of soak zone to within 2 F.

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Sound connections are of utmost importance to every project, especially today as requirements become increasingly critical. Many times the unusual is the economical answer. Making the unusual is an important part of our service. And because of our complete facilities and design engineering experience, we usually come up with complete answers.

For operating dependability and efficiency, we might suggest a slight modification of design or material of the part in use. Then again, one of our many standards may better suit your needs. Either way, if you have a particular connection problem—one requiring a low-cost solution, let us see what we can do to help. The services of our specialists are readily available through your Screw and Bolt representative. Contact him today or write us direct. Others do.

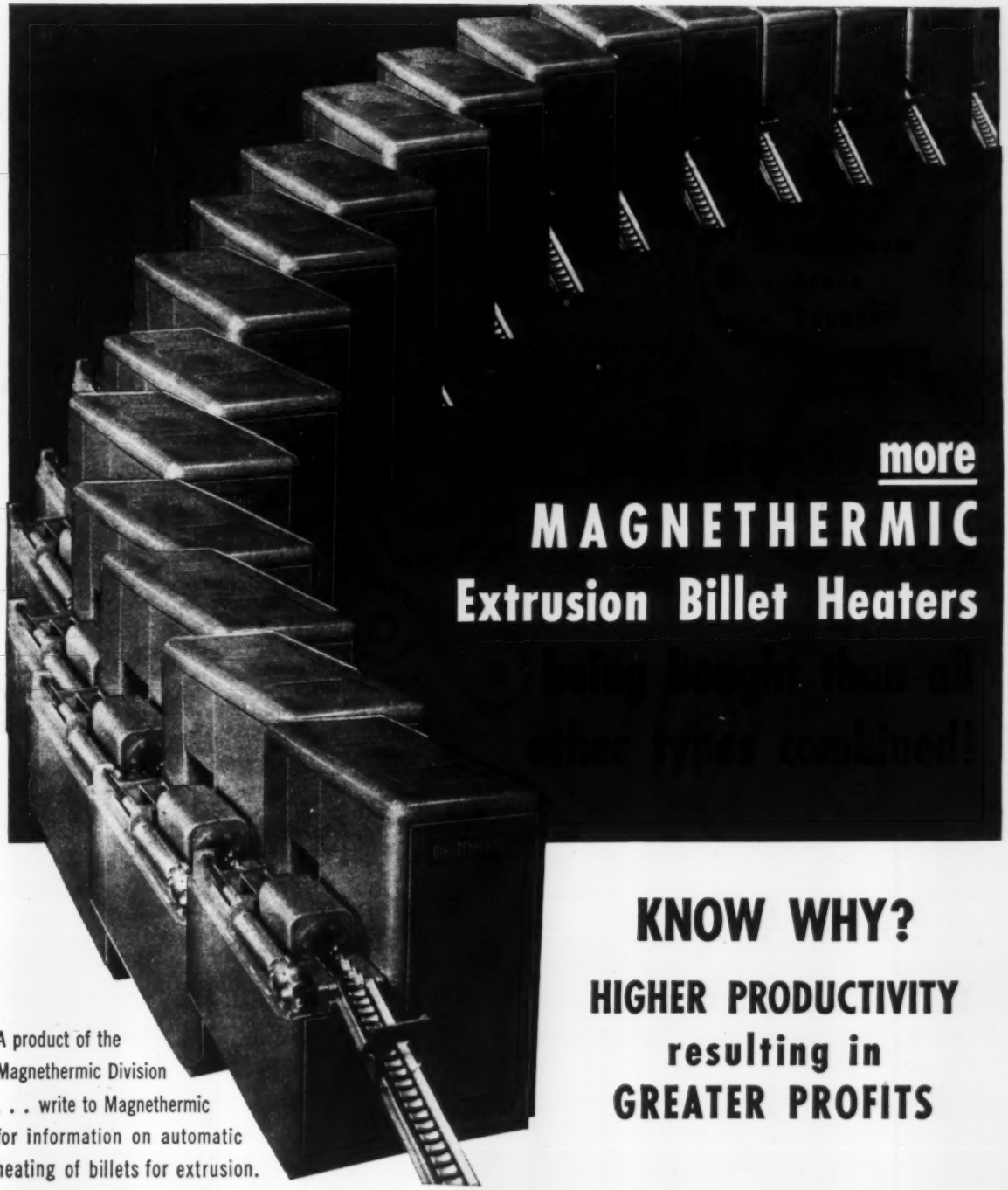
VMA 6732

SCREW AND BOLT CORPORATION OF AMERICA

SERVES THE NATION

Formerly Pittsburgh Screw and Bolt Corporation • P. O. Box 1708 Pittsburgh 30, Pennsylvania

AMERICA'S MOST COMPLETE LINE OF INDUSTRIAL FASTENERS



more

MAGNETHERMIC
Extrusion Billet Heaters

KNOW WHY?

HIGHER PRODUCTIVITY resulting in GREATER PROFITS

A product of the Magnethermic Division . . . write to Magnethermic for information on automatic heating of billets for extrusion.

Induction Heating is our ONLY Business

Ajax Magnethermic CORPORATION

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MAGNETHERMIC DIVISION
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Youngstown 1, Ohio

AJAX ENGINEERING DIVISION
P.O. Box 1418 • Lalor & Hancock Streets
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AO H-3 Face Shield

AO Face Shields cut accident costs by providing quality eye and facial protection on metal sawing, chemical work, buffing, sanding, light grinding, incandescent lamp, electronic tube, glass bottle manufacturing, bottling and other operations. The H-3 (shown) has a back headband of durable vulcanized fiber. Fits lower head snugly, comfortably. Easily adjustable — won't pull hair. Standard genuine leather sweatband and snap-on acetate window are easily replaced.

FEATURES — Slotted windows allow for expansion and contraction in heat — extra deep spark deflector for added protection — extra inch nose clearance for better ventilation, reduced fogging — many other advantages.

LIKE AO SAFETY GLASSES...

These AO Accessories Cut the High Costs of Eye Accidents!

AO 9706 HELMET

This new type helmet combines light weight with other proven features. Made of moisture resistant dark gray fiber glass. Curved chin, light front aluminum glass holder. Dielectric. Headgear adjustment is simple — gives welder a comfortable fit instantly.

AO 350 AF SUPER-CLEAR

Tested against "the field" (8 other anti-fogging liquids), Super-Clear was way ahead in providing clarity LONGER! Tests were conducted in a refrigerated unit at 40° below, also in an oven controlled to body temperature of 98°. One user reported Super-Clear as "at least 100% better than the liquid previously used. Remember, Super-Clear is a glass and plastic *cleaner* as well as an anti-fog. Just spray it on — wipe it off!

YOUR NEAREST AO SAFETY PRODUCTS REPRESENTATIVE CAN SUPPLY YOU

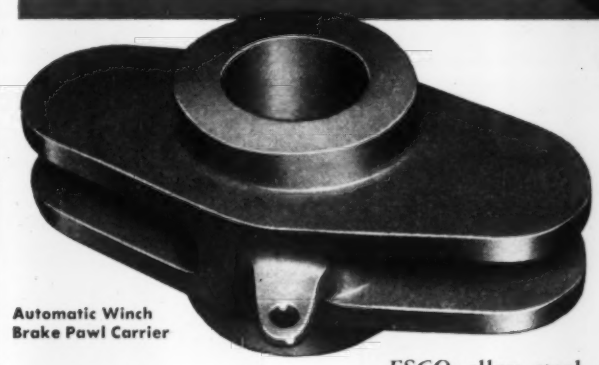
Always insist on AO Trademarked Safety Products

American Optical
COMPANY
SAFETY PRODUCTS DIVISION
SOUTHBRIDGE, MASSACHUSETTS
Safety Service Centers in Principal Cities

BEFORE YOU SAY

"IT CAN'T BE CAST"

Transmission Shifter Fork



Automatic Winch
Brake Pawl Carrier

CALL AN ESCO ENGINEER

ESCO alloy steel castings can make your designing *easier*. You get the part you want, in the alloy you need and in the shape that saves you the most fabricating, machining and finishing time.

PLUS METALLURGICAL ENGINEERING AND RESEARCH
ESCO maintains one of the largest and best equipped metallurgical staffs of any alloy steel foundry—

PLUS PRODUCT ENGINEERING AND DESIGN
An integrated service at all levels; in the field, at the drawing board and in the foundry—

PLUS FOUNDRY FACILITIES AND CASTING EXPERIENCE
A casting service that covers the complete range of alloy steel casting methods of all applications—

PLUS LABORATORY INSPECTION AND TESTING
ESCO laboratory technicians are qualified and equipped to perform all types of inspections and testing to the most rigid specifications.

Call an *ESCO* Engineer — let him show you how *ESCO* Alloy Steel Castings make your designing easier.

Write for FREE copy of 100-page reference book, "*ESCO* Alloy and Stainless Steels for the Process and Manufacturing Industries".

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ELECTRIC STEEL FOUNDRY COMPANY
2160 N. W. 25TH AVE. • PORTLAND 10, OREGON
MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y.
IN CANADA *ESCO* LIMITED

Cold Bonderite Earns Supplier of the Month Award for Parker

DETROIT, MICH.—The Parker Rust Proof Company, pioneer manufacturer of surface treatments for metals, was named "Supplier of the Month" by the Home Laundry Department of General Electric Company in a ceremony at Louisville April 20.

The award and citation were presented by R. J. Keyser, Manager of Manufacturing of the Home Laundry Department of General Electric Company, to R. W. Englehart, President of Parker Rust Proof Company.

Basis of the award, according to the citation, was the performance of Cold Bonderite, installed in the finishing system on recommendation of Parker engineers. The material substitution in three phosphate units resulted in a considerable savings per year in steam costs and has also lowered the ambient temperatures of the paint enclosures in a very positive way. This material, an exclusive product developed by Parker Rust Proof Company, was installed without additional cost in materials, investment or labor.

Everybody's enthusiastic about Cold Bonderite! Since its introduction a year and a half ago, over one hundred plants have installed this revolutionary new system. Cold Bonderite System solutions operate at temperatures 40° to 75° below temperatures in conventional systems, saving important sums in heat costs, maintenance and equipment.

Cold Bonderite can be a winner in your spray finishing line, too! Call in the Parker man right now.

Since 1914—leader in the field

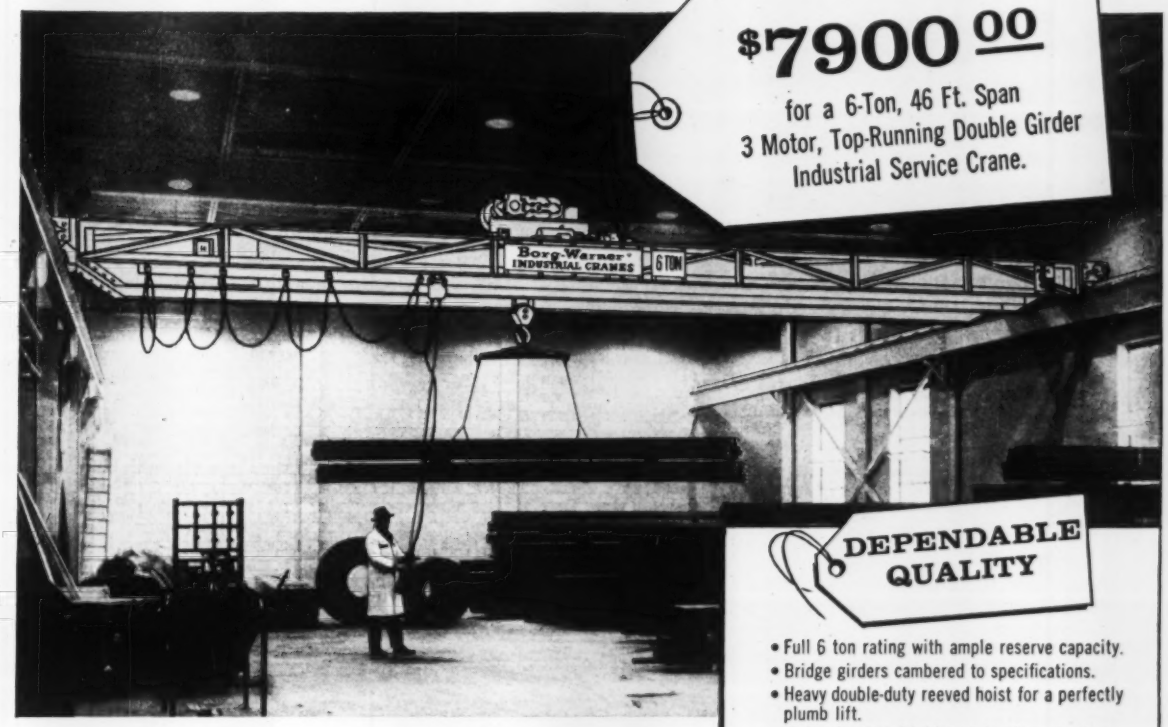
Parker Rust Proof Company

2158 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base	BONDERITE and BONDERLUBE aids in cold forming of metals	PARCO COMPOUND rust resistant	PARCO LUBRITE—wear resistant for friction surfaces	TROPICAL—heavy duty maintenance paints since 1883

*Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

Now you can afford Borg-Warner Quality in your next overhead Crane...



$7900.00
for a 6-Ton, 46 Ft. Span
3 Motor, Top-Running Double Girder
Industrial Service Crane.

DEPENDABLE QUALITY

- Full 6 ton rating with ample reserve capacity.
- Bridge girders cambered to specifications.
- Heavy double-duty reeved hoist for a perfectly plumb lift.
- Heavy duty steel bridge and trolley wheels.
- All welded jig bored, jig assembled end trucks.
- Long life precision ball and roller bearings throughout.
- Precision assembly of girders and end trucks with fitted bolts in reamed holes.
- Outrigger machinery girder construction.
- Magnetic bridge brake.
- Heavy duty gear reduction bridge drive.
- Fluid coupled bridge and trolley drives.
- Full magnetic push-button floor control.

ADVANCED DESIGN

The crane illustrated is a typical double girder installation. Span may be shorter or longer with greater or smaller capacity and for lighter or heavier duty, intermittent or continuous. Whatever your overhead handling requirements Borg-Warner Industrial Cranes can supply your needs with quality equipment at a price you can afford!

Advanced engineering and standardization make...

Borg-Warner Industrial Cranes

BETTER VALUES at LESS COST

Borg-Warner crane engineers and production men have taken a new look at the entire line and come up with important economies through extensive use of standardized interchangeable components. Because these savings are passed along to you, you get more crane for your money when you specify Borg-Warner Industrial!

Efficient overhead materials handling pays off. You get more overhead storage space than fork truck handling provides. You benefit from aisles and work areas uncluttered by floor-type handling equipment. You can reach all areas under the crane, the full length of the runway.

If you are planning a new factory building, an addition to present facilities or a modernization program, it will pay you to look to Borg-Warner Industrial Cranes for the best values in overhead materials handling equipment.

Industrial CRANES — I B-W — INGERSOLL PRODUCTS — BORG-WARNER

Design it better . . .
Make it better.

Find Your Nearest Distributor Under CRANES In The Yellow Pages

Distributors in all principal industrial cities.

Borg-Warner® INDUSTRIAL CRANES

1550 S. PAULINA STREET, CHICAGO 8, ILLINOIS

Export Sales: Borg-Warner International, 36 South Wabash St., Chicago 3, Illinois

Don Chisholm solved a double problem at Split Ballbearing . . .

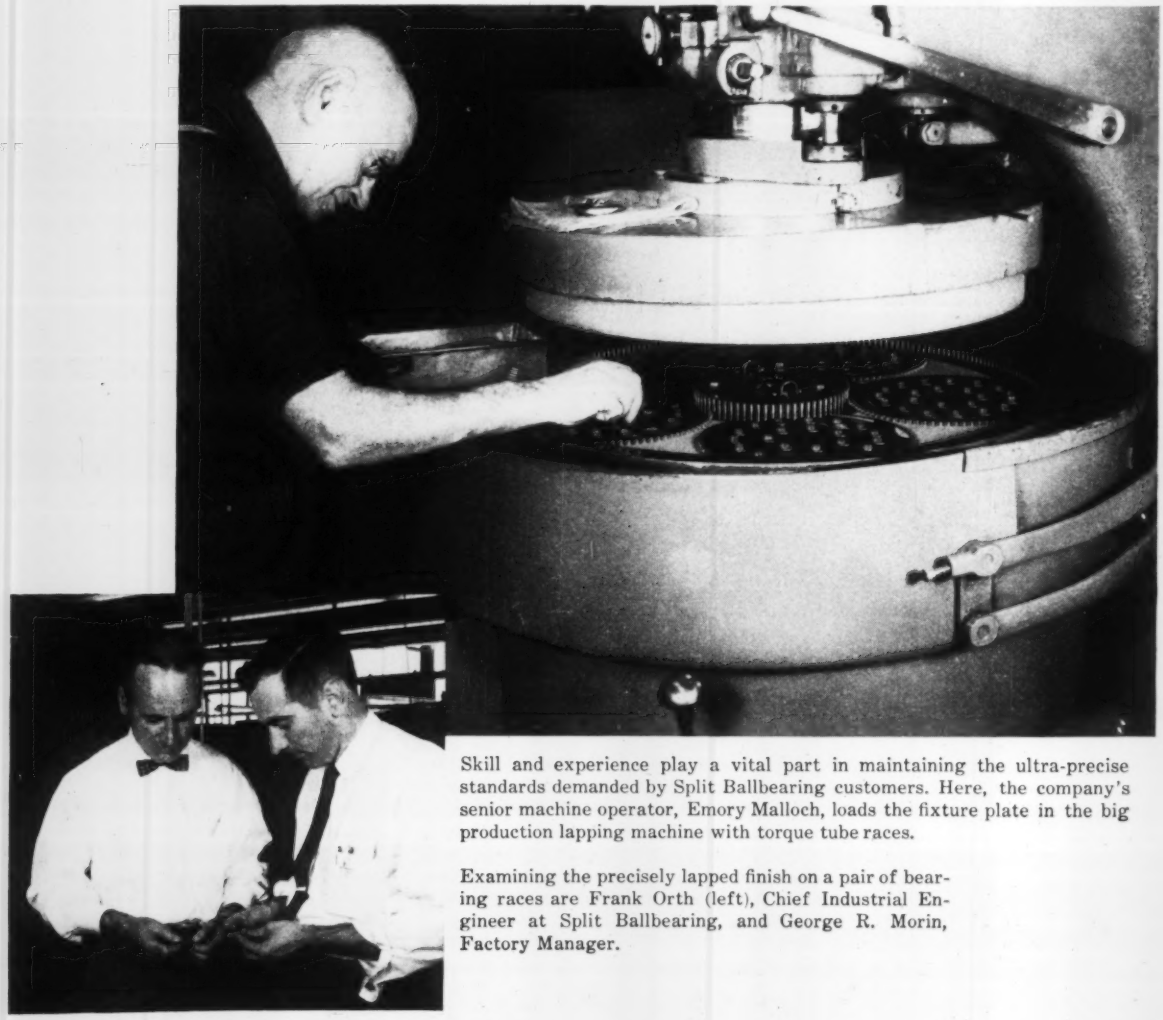
It all started with a torque tube bearing for one of the top priority missile guidance systems. Two kinds of trouble had developed during the manufacturing process and engineers at the Split Ballbearing Division of Miniature Precision Bearings, Inc., Lebanon, N. H., were in a hurry to get both of them straightened out.

First, in bore-grinding the inner race, about .010″ of stock had to be removed, but the tolerance specified was a microscopic ±.0001 and an eight microinch finish was mandatory. The bore-grinding wheel used wasn't up to requirements and the reject rate was excessive.

Second, in lapping the faces of both races, the wheels used were not producing the required five microinch finish, there was an imbalance between the amount of stock removed from the upper and lower surfaces . . . and, on top of that, the wheels themselves broke down too rapidly.

Bay State was called in and Abrasive Specialist Don Chisholm attacked the problem, working closely with Distributor Harold Domingue, Abrasives & Tools, Inc., Auburn, Mass. They not only cured both troubles and brought production up to the standards required . . . the people at Split Ballbearing were so delighted they asked Chisholm and Domingue to make a survey of every grinding operation in the plant. This led to fourteen other carefully considered recommendations.

Like Hal Domingue and Don Chisholm, the Bay State people in your area are trained specialists. Whether you have a single problem or a multitude of them, they're ready to apply experience, imagination and plain hard work. *Better grinding at lower cost . . . that is their business.*



Skill and experience play a vital part in maintaining the ultra-precise standards demanded by Split Ballbearing customers. Here, the company's senior machine operator, Emory Malloch, loads the fixture plate in the big production lapping machine with torque tube races.

Examining the precisely lapped finish on a pair of bearing races are Frank Orth (left), Chief Industrial Engineer at Split Ballbearing, and George R. Morin, Factory Manager.

and they gave him 14 more!

Don Chisholm has built a formidable reputation for solving tricky abrasive problems. Prior to joining Bay State as an abrasive specialist, he spent 17 years as Abrasive & Tool Coordinator at General Electric's turbo-super-charger and jet engine plants where his experience was extremely varied since he had to use abrasives on unusual alloys as well as the general run of industrial metals.

BAY STATE ABRASIVES

BAY STATE WHEELS of PROGRESS

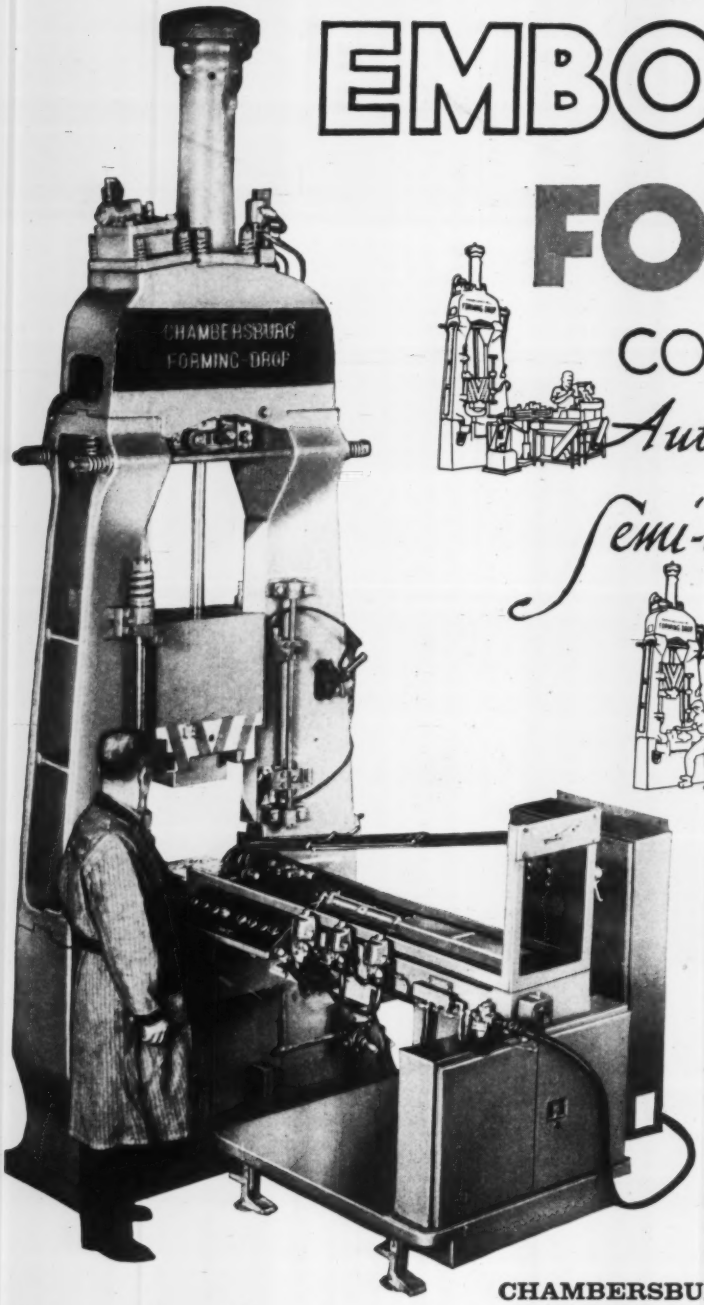
Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh, Los Angeles. *Distributors:* All principal cities.

COINING
EMBOSSING
FORMING
COLD STRIKING

Automatically

Semi-automatically

Manually



The new Chambersburg Forming Drop meets the demand for an accurate, high production hammer for coining, embossing, forming and cold striking. The impact blow, which minimizes springback, can be precisely adjusted to suit particular job requirements. Electric controls permit the use of versatile feed devices increasing operator safety and efficiency.

A Chambersburg representative will be glad to show you a film depicting this new production method. Phone or write for further details.

CHAMBERSBURG ENGINEERING COMPANY
CHAMBERSBURG, PA.

CHAMBERSBURG
FORMING DROP

STANSCREW

Symbol of a new concept

in fastener service

American industry is learning Stanscrew means extra values.

This symbol personifies a trained staff of fastener specialists. Their technical assistance can often help you reduce fastener and assembly costs.

It means extra quick deliveries from complete inventories maintained at three conveniently located plants . . . over 5,000 different types and sizes to assure a broad selection for the great majority of your requirements . . . and, above all else, fasteners of consistently high quality.

Although it first appeared in 1958, the Stanscrew trademark represents a wealth of fastener experience. For it combines the technical skills and specialized facilities of three major manufacturing divisions of Standard Screw Company, each an honored name for more than 80 years. They are:

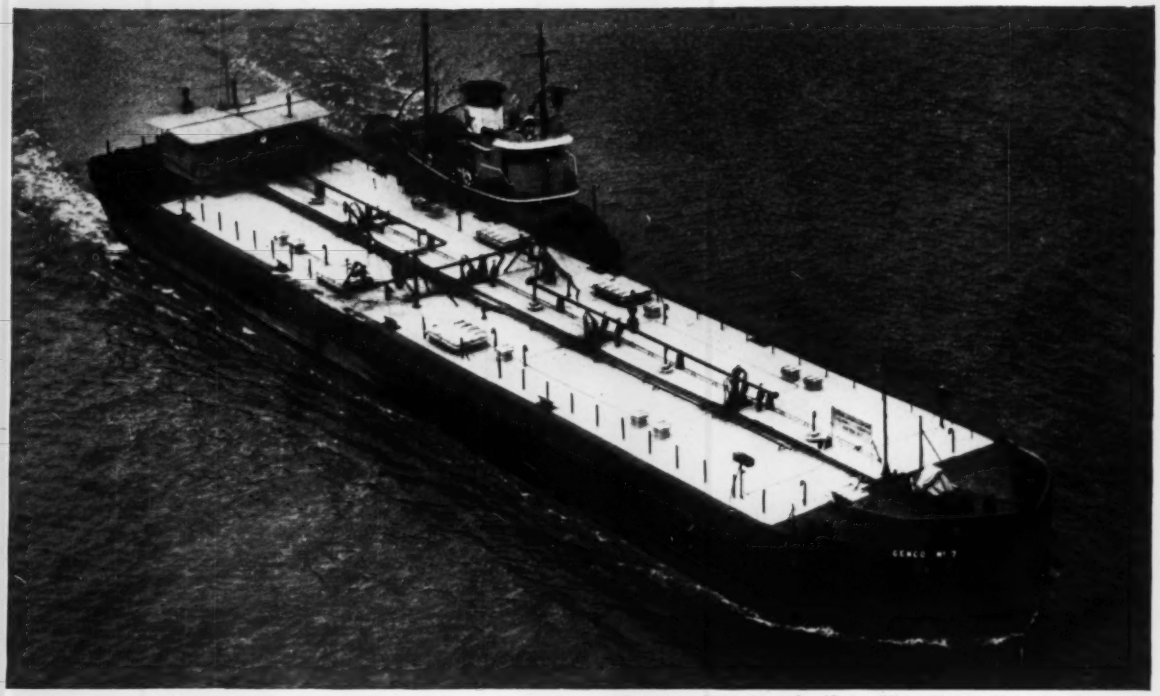
THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

For fasteners, specify Stanscrew. For other needs of home and industry, Standard Screw divisions also produce:

Moen single-handle faucets • Hartford textile spindles
Roosa Master fuel injection pumps • Chicago tappets

Each division also provides a complete design and manufacturing service for cold headed and screw machine products.

STANDARD SCREW COMPANY
2701 Washington Boulevard • Bellwood, Illinois



Capacity—2000 tons of sulfuric! *The "Genco 7" is the largest in General Chemical's fleet of eight sulfuric acid barges.*

Call on **GENERAL CHEMICAL** for ***Sulfuric Acid*** *...As you need it! ...When you need it! ...Where you need it!*

Whether your sulfuric acid requirements are measured in thousands of tons or carboy lots, General Chemical is best equipped to handle your order.

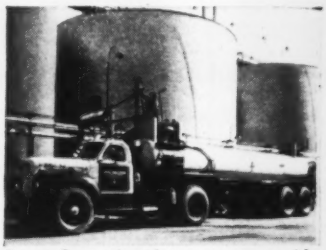
General's extensive network of production facilities plus its large and flexible transportation system assures you of sulfuric as you need it . . . when you need it . . . where you need it!

For example, we have eight sulfuric barges serving customers along the Atlantic coast and on inland waterways. Three operate out of Marcus Hook (Philadelphia), Pa. Two in the New York City area, including the 2000-ton capacity "Genco 7" shown above. Three on inland waterways. General also operates the largest fleets of sulfuric tank cars and tank trucks in the country.

General Chemical has 21 sulfuric plants,* as well as stock points in key industrial centers across the country. Each is geared to meet regional requirements, offering customers the advantages of "next door" location to General's modern facilities. In addition, the output of one plant backs up that of another, making a coast-to-coast supply line which proves invaluable in meeting emergencies or unexpected demands.

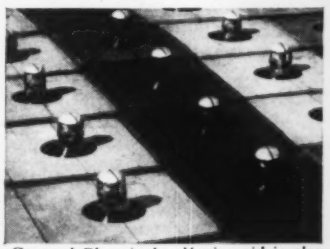
Why not find out how our long experience and extensive facilities can benefit you? For further information, write or phone the nearest General Chemical sales office.

**In Canada: Allied Chemical Canada, Limited*



Large fleets of tank transports provide fast over-the-highway service.

By far the largest fleet of sulfuric tank cars is operated by General Chemical.

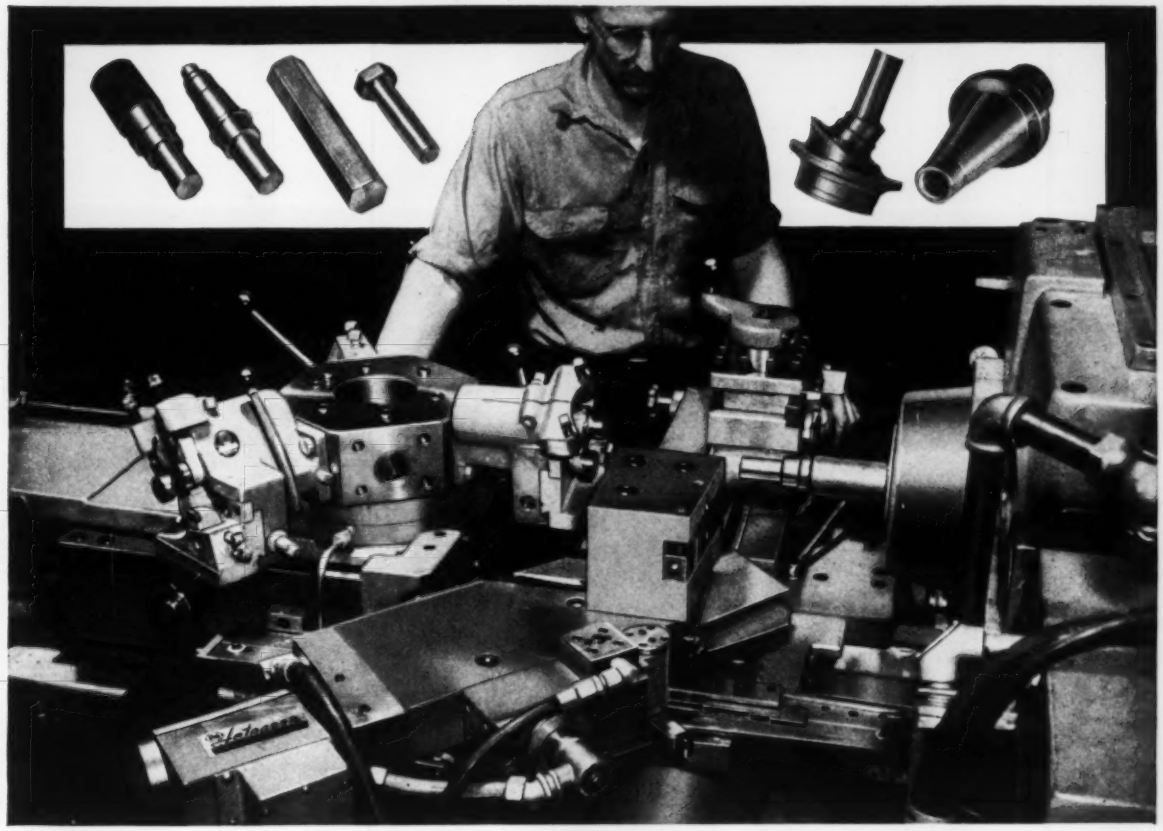


General Chemical sulfuric acid is also available in 13-gallon carboys.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

Want to cut costs on parts like these?



Here's how tracing will help you save

The simple, basic setup shown above handles nearly 300 different parts for a well-known manufacturer of drive line components. All work is performed on one Gisholt MASTERLINE No. 4 Ram Type Turret Lathe with a JETracer on the rear of the cross slide. Standard tools on the hex and square turrets are used to face, chamfer and reduce the stock while the JETracer finishes all diameters, steps, blends and radii. The 6 3/16"-long, 2"-diameter stepped shaft (above at left) is typical and is completed in two operations with total f.t.f. time only 4.95 minutes.

Here are just a few things the JETracer can do for you:

- **Shorten setup and change-over time**
- **Simplify machining and eliminate operator errors**
- **Save cost of form tools, multiple tool blocks and holders**
- **Reduce inspection time (only one length and one diameter need checking)**
- **Minimize or eliminate secondary operations (through finer finish, greater accuracy)**
- **Increase production through automatic machining of complex surfaces**
- **Free operator to handle extra units or perform other work**

Gisholt has developed a complete line of JETracers for use with ram and saddle type turret lathes, automatic turret lathes and single-spindle chucking lathes. These include rear cross slide, turret and independent slide mounted units, single or multi-pass types. *All are designed to operate at full capacity of the machines to which they are applied, without limiting machine functions or restricting the use of standard tools.*

You'll want to see for yourself how the JETracer adds flexibility, speeds operations and cuts costs on standard and problem parts. Send the coupon today for your free copy of the new JETracer catalog, or call your Gisholt Representative for complete information.

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE

Gisholt Machine Company
1217 E. Washington Ave.
Madison 10, Wisconsin

Please send a copy of the new Gisholt JETracer catalog.

Name ..... *Title* .....

Company .....

Street address .....

City ..... *Zone* ..... *State* .....

TEXACO ORGANIZED LUBRICATION CAN HELP YOU...

Get rid of the "guns" that "misfire"

His grease guns are aimed at your profits; they can help boost them—or eliminate them altogether. Here's why:

You used to need a different grease for nearly every job. That meant 20 or 30 lubricants in the plant, with the almost inevitable danger of misapplication — and damaged machinery.

Unless you're operating on the basis of a modern lubrication survey, *the chances are that this situation still exists in your plant!*

A Texaco Organized Lubrication Plan uses a minimum number of proper oils and greases—including newly developed multi-purpose lubricants—to reduce your inventory by as much as 80% and virtually eliminate this problem.

Get the details on Texaco Organized Lubrication. Contact your local Texaco Lubrication Engineer or write for "Management Practices that Control Costs via Organized Lubrication."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. S-102.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

STRIP for action . . .

The efficient action of a Flat Spring is dependent upon the quality of the STRIP STEEL.

WASHBURN

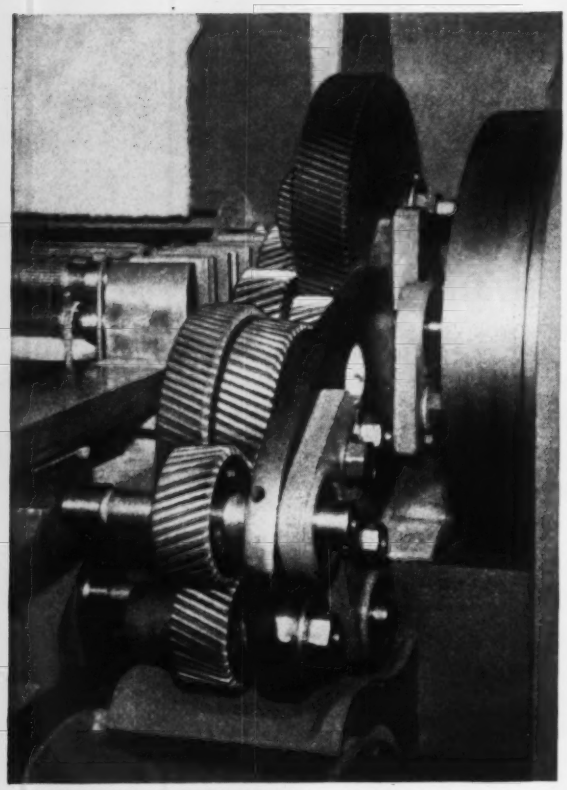
has over fifty years of experience in solving spring steel problems, to guarantee the quality of your product.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Put strength, long life, silence into gears and couplings with CDF Celoron® molded plastics



CELORON-TO-CELORON GEARS in drawing rolls made by Ideal Industries, Inc., Bessemer City, N. C. These are helical-cut gears—the toughest to machine, requiring the toughest material. Celoron is it. Other Celoron parts for this application are shown below, top right.

WORK MIRACLES IN MACHINERY with this amazing golden phenolic material! Celoron gears help eliminate noise and reduce wear on mating metal gears. Even the roughest-used helicals last . . . and last . . . and last.

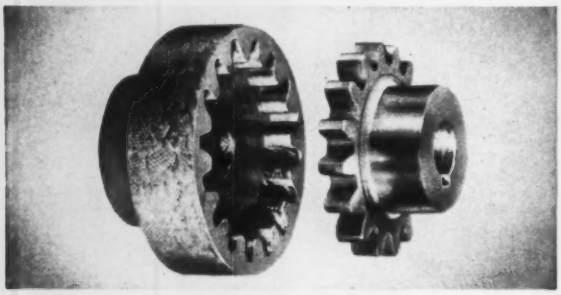
HIGH MECHANICAL STRENGTH. Typical Celoron strengths: tensile, 6,500 psi; flexural, 10,000 psi; compressive, 25,000 psi; shear, 8,500 psi. Dimensionally stable and readily machined, Celoron fills the bill where costly metal parts fail.

ELECTRICAL INSULATION VALUE. Celoron is a non-conductor with high electrical insulation value. It makes ideal mechanical-electrical parts. Celoron couplings effectively insulate motors from driven machinery.

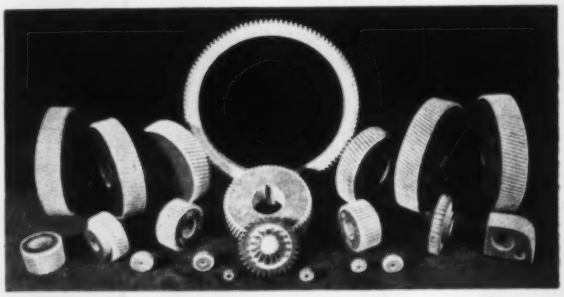
CDF FABRICATION SERVICE. Let the plastics-fabrication and molding experience of CDF save you time and money, and assure you delivery of production quantities of CDF plastics and molded parts—on time and as specified. The CDF man can help you from the very beginning. See his phone number in the Product Design File (Sweet's). Or send us your print or your problem, and we'll return samples and technical literature for your evaluation.

CDF **CONTINENTAL-DIAMOND FIBRE**

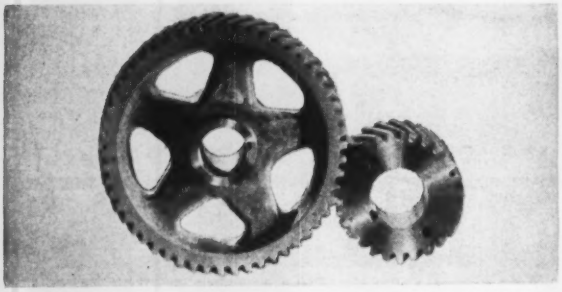
A SUBSIDIARY OF THE Bakelite COMPANY • NEWARK , DEL.



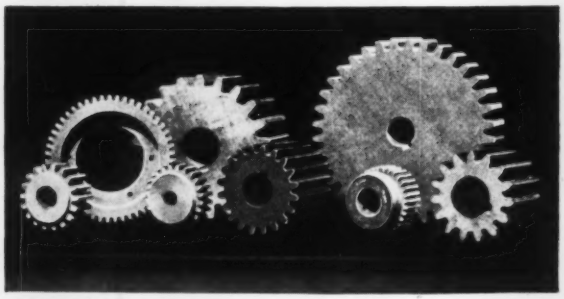
LOW-COST, EASILY-ASSEMBLED CDF Celoron flexible coupling transmits power smoothly, silently . . . insulates motor from machine . . . needs no lubrication . . . works vertically or horizontally.



PRECISELY MACHINED KEYWAYS help keep these Celoron parts silent and strong in the Ideal drawing rolls illustrated in top photograph. Note wide range of sizes and shapes.



CELORON-TO-STEEL combination makes this long-wearing timing mechanism for gasoline engines. Celoron gear absorbs shock, cuts sound to a minimum, holds timing longer.



STRONG, SILENT CELORON makes both drive and driven gears. In fact, many machine applications are 100% Celoron geared for light weight, elimination of excess play, long life.

Here, a slip joint collar is being turned and bored from a T-6 aluminum blank. Floor-to-floor time is only 25 minutes, a 30% saving in time alone.

even an engine lathe can have an impressive record of savings if it's a LODGE & SHIPLEY POWERTURN

records show $2000.00 annual saving . . . 30% on a typical operation

Significant savings are nothing new on production type lathes but it is something to write home about on an engine lathe. Tacoma Boatbuilding Co., Inc., Tacoma, Washington, liked the accuracy, versatility and output of their POWERTURN Lathe . . . found impressive savings even when this engine lathe was used for non-repetitive operations.

Whatever your turning requirements, consider Lodge & Shipley. Your needs can be filled precisely from a complete range of sizes and types . . . Production, Engine, Toolmaker, Gap, Hydraulic Tracer Controlled and Right Angle Chucking Lathes . . . all designed to provide the best machine for a specific job.

Check Sweet's Machine Tool File, your telephone book Yellow Pages or write direct for literature: **The Lodge & Shipley Company, 3070 Colerain Ave., Cincinnati 25, Ohio.**

Your Lodge-ical choice . . .

Lodge & Shipley

ANNOUNCING

expanded, nation-wide service on

ALUMINUM

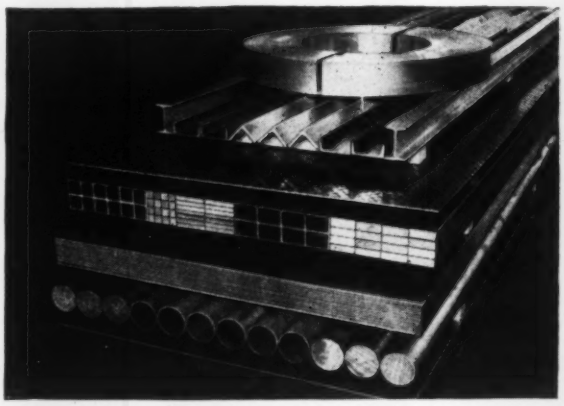
from Ryerson stocks

Here are two important new developments in Ryerson service on Reynolds aluminum. First, stocks are now available from our plants coast to coast. Second, a much broader range of sizes and types are now on hand—and aluminum building products have also been added. Here's what this expanded service offers you:

Widest selection—Stocks include rod and bar, plate, flat and coiled sheet, tubing, pipe, and structural and extruded shapes in a complete range of alloys, tempers and sizes. Also available for quick shipment: building products, including corrugated and V-beam roofing and siding, ribbed embossed siding, roof deck and insulated wall system. Non-standard or "hard-to-get" items are no problem—we can supply *all* your needs.

Unequaled cutting facilities—Ryerson equipment includes latest mill-type slitters, cut-to-length lines, shears, saws and abrasive disc cutters—facilities that save you time and money.

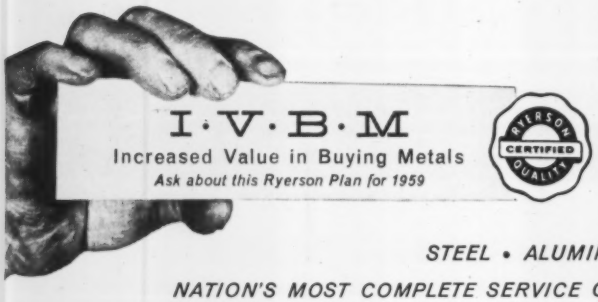
Expert technical help—Your Ryerson Representative is well qualified to serve you. Backed by a staff of experienced aluminum specialists, he is ready to help with any problems involving the selection and fabrication of various aluminum alloys.



All types, shapes and sizes of aluminum ready for immediate shipment from expanded Ryerson stocks—including building products

Fast, dependable delivery—The nation's most complete service centers, in principal cities coast to coast, assure dependable delivery as promised—in a matter of hours if needed.

Whatever your aluminum requirements—whatever your selection and fabrication problems—*call Ryerson.* You'll get prompt, personal service on *aluminum* as well as *steel.*



RYERSON CERTIFIED QUALITY

RYERSON STEEL®

Member of the INLAND Steel Family

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

Metalworking's Outlays for Capital Equipment Will Hit . . .

$2.79 Billion

That's the near-record amount metalworking will spend for equipment in the second half of 1959, a new STEEL survey discovers. The first of its kind, this survey tells what industries will be the major markets for nine separate classes of equipment in the second half. It's based on confidential plans given STEEL by companies representing nearly one-third of metalworking's total outlays for capital equipment (Page 56).

What Purchasing Agents Think

A National Association of Purchasing Agents survey of members finds that business remains brisk, but the rate of expansion is slowing. Of the respondents, 46 per cent said production improved in June; 6 per cent noted declines. In new orders, 42 per cent noted gains; 10 per cent reported decreases. Thirty per cent of the PAs are buying more foreign goods now than they did five years ago, but 39 per cent still are making no foreign purchases. The PAs report some small price increases, but no wave of inflation in any industry. Most are still trying to keep inventories at the lowest possible level, but the buildup of steel stocks continues.

Air Your Tax Problems

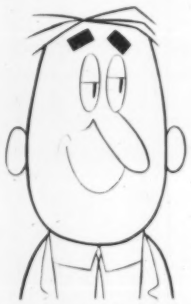
Sen. George Smathers (D., Fla.), left, and Sen. Alan Bible (D., Nev.), right, are two of your Washington representatives ready to hear your depreciation problems. Their committees will hold hearings on July 22 (Page 55). Written opinions will be noted.

States Vote Big Boosts in Jobless Pay

Lawmakers in 17 states have raised cash benefits for the unemployed by $2 to $14 weekly. Several others may take similar action soon, reports Commerce Clearing House, Chicago. Iowa jumped its maximum weekly benefits to $44 from $30; Washington, to $42 from $35; Hawaii, to $45 from $35. Alaska pays the most—$70 a week. Maximums in other top paying states: Connecticut, $62; Nevada, $57.50; Michigan, $55; Wyoming, $49; Illinois and New York, $45. Ohio will be a top payer, at $56, if Senate-approved

legislation is passed. Thirteen states have enacted permanent increases in the number of weeks an unemployed person may draw benefits.

Steel Consumers Ready for Anything



This fellow's haggard look indicates weariness from following the lengthy steel wage talks. But his smile points up the fact that he's ready for almost any development in the negotiations. His inventories are adequate to carry him through a short strike, but they're not so high that they'll be unwieldy if a peaceful settlement is reached. He's also happy that the steel industry has taken a firm stand against an inflationary price increase (Page 51).

While Steel Deliberates, Wage Spiral Continues Elsewhere

Almost lost in the concern over wage negotiations in the steel industry is the continuing wage push in other fields. The developing pattern amounts to about 5 per cent in wages plus beefed up fringe benefits. Workers in the telephone, coal, construction, oil, and trucking industries have already grabbed wage boosts. Automatic raises go to employees in the auto, aircraft, chemical, electrical, farm equipment, and other industries.

Labor Seeks More Job Security

Look for unions to exert more pressure to shorten the workweek and to try more gimmicks that will tighten seniority provisions (Page 66). More liberal vacations, a seventh—and commonly now an eighth—paid holiday, and more washup time cut into the average workweek. Here's another productivity killer: Contract clauses providing that the workweek will be shortened before extensive layoffs are made. It limits your ability to place the most experienced men on the most efficient equipment during times of poor business.

Plant Jobs May Never Reach '57 Level

The Labor Department's Robert M. Shaw says the number of factory jobs may never again reach prerecession highs. Many may have been wiped out during the recession by improved technology and more efficient equipment, he reports. Factory employment lags substantially behind the rise in industrial production.

Plastics Grab Chunk of Auto Market

Vacuum metallized plastic—lighter, brighter, and cheaper than chrome plated metal—will find limited applications on some 1960 cars and is scheduled for widespread use on the 1961 models, reports National Research Corp. A new NRC development—a special thick film process—will permit vacuum metallizing to be used for outside surfaces, the company claims. In the '60 models, however, principal uses will be for interior trim and functional parts like horn buttons, speedometer dials, arm rests, dome lights, and instruments.

Keeping Pace with Technology?

If so, you'll recognize the picture as an explosive forming technique. It's one of the new metalworking methods that will find wide usage in the next few years. As a metalworking manager, you should be familiar with it and other new methods. Keeping pace with technology is every manager's job; it's not the exclusive domain of R&D people. For tips on how to keep pace and what others are doing, see Page 95.

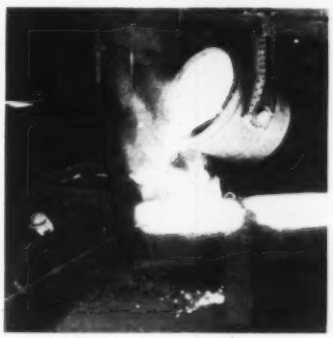
Have Instruments, Will Sell . . . Object: Propaganda

A spokesman for the Scientific Apparatus Makers Association says Russia is offering classroom laboratory apparatus to an American importer at prices averaging one-fifth those of comparable U. S. made items. It's obvious, he asserts, that they're subsidizing its sale and dumping it on the American market to bolster their claims of technological superiority over the U. S.

Government to Encourage Foreign Investment

Chances are good for tax incentive legislation to encourage U. S. foreign investment. Officials of the State, Commerce, and Treasury Departments told the House Ways & Means Committee that it would help combat Soviet economic aid. Look for the committee to report out a bill along these lines. It may not get Senate action until next year, though.

Domestic Manganese Program Falters



The U. S. is the world's largest user of manganese, yet it depends on foreign sources (Africa, Brazil, and India) for 85 per cent of its needs. An emergency could shut off our supplies of the strategic material, essential in the manufacture of steel. Yet the government fails to properly encourage domestic production, charges J. Carson Adkerson, president, American Manganese Producers Association. Russia has large resources (Page 63).

Truck Exhaust Notes

Automobile Manufacturers Association reports: 7.4 million Americans are employed in the manufacture, sale, service, and use of motor trucks . . . The nation has 59,000 truck fleets of ten or more vehicles . . . One-fifth of the nation's truck production is exported (Biggest markets: Brazil, Mexico, Venezuela) . . . 600,000 trucks were scrapped last year, while 870,801 were produced . . . There are more than 11 million trucks registered in the U. S. (Farmers own 2.9 million) . . . Only 600,000 prewar trucks are still in use . . . 40 per cent of trucks are eight or more years old . . . States that were

biggest markets for trucks last year: California (72,651 registrations), Texas (64,942), New York (37,549), Pennsylvania (33,408), Illinois (30,916), Ohio (27,690).

Maintaining Heat Treat Controls

Maintaining accurate control of heat treating equipment can be an economical, highly effective, and efficient routine. A new method, devised by Georgia Div., Lockheed Aircraft Corp., has cut operating costs, improved product quality, and practically eliminated furnace downtime due to instrument maintenance (Page 106). Spare instruments are substituted for those that are to be overhauled. A furnace control test bench (picture) and two portable test carts are used.

GE Cuts Rectifier Prices Again

General Electric Co. again lowered prices of its silicon controlled rectifiers (thimble size electronic components that change alternating current to direct current and regulate the amount of electric current fed into equipment). Reductions range from 25 per cent on the 16 ampere, 200 volt model to 14 per cent on the 10 ampere, 300 volt model. Expect prices to drop even more as production volume continues to climb.

For Free Cement, Move to Arkansas

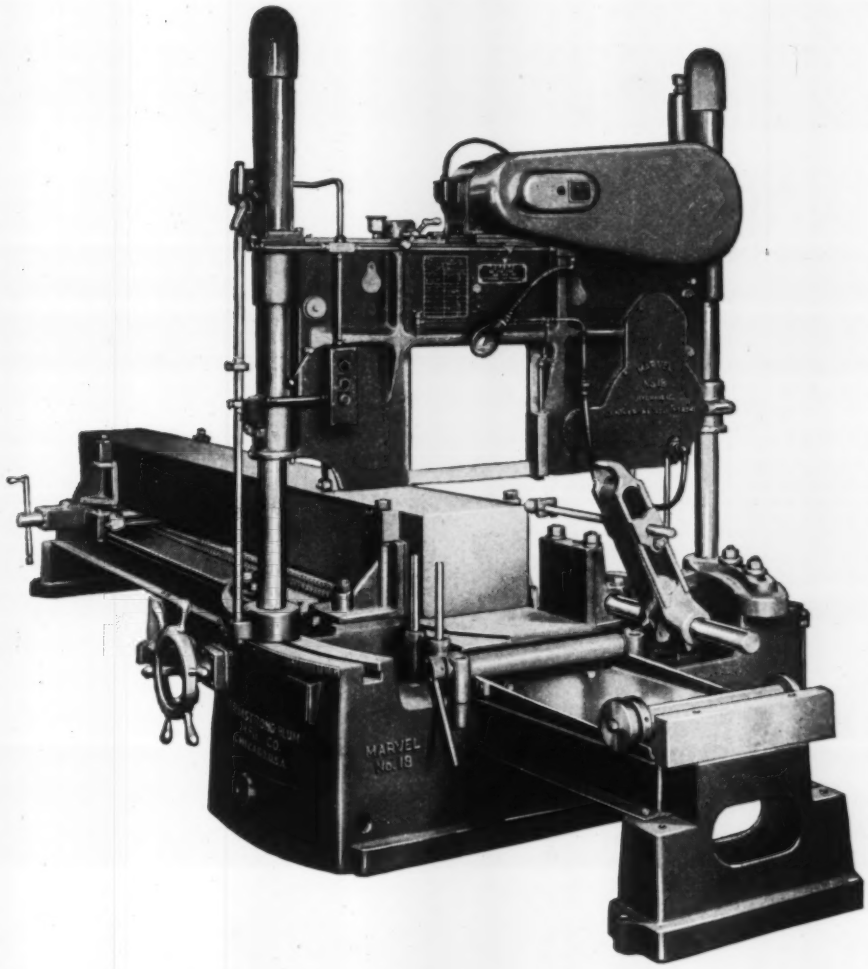
Arkansas Cement Co., a subsidiary of Arkansas Louisiana Gas Co., is offering free cement to any municipal development agency in the state if it's used to construct an industrial plant. The utility figures anyone moving into the state will become its customer. It's another of many come-ons now offered by groups pushing area development (See STEEL, June 1, p. 52).

Will You Run Out of Water?

Providing enough water for growing industrial and home use is becoming a critical problem, contends Col. W. F. Rockwell, chairman, Rockwell Mfg. Co. Americans use 290 billion gallons of water daily. By 1975, we'll need 50 per cent more than is available today, believes Colonel Rockwell.

Straws in the Wind

Businessmen are beginning to feel the impact of tight money, but it's causing more buying to beat even more expensive borrowing costs, rather than slowing business expansion . . . Mallory-Sharon Metals Corp. is inaugurating a new program to develop titanium products for pulp and paper processors . . . The Engineers & Scientists of America, a whitecollar union, is planning to set up a mutual fund . . . 1205 gondola and hopper rail cars will be made of aluminum . . . June auto sales hit 580,500—the highest monthly total since September, 1955.



No Job too big or too tough . . .

for MARVEL "*Giant*" Hack Saws

These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18″ x 18″; and No. 24, Capacity 24″ x 24″) were *basically* designed for rapid and economical cut-off of BIG WORK. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to *finished*, square ends, eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—*without moving the work*.

Contemplating the modern trend toward ever tougher steels and larger sizes, these are the logical sawing machines to buy, not only for today's needs but for tomorrow's as well.

Write for Catalog

Metal Cutting MARVEL SAWS
Better Machines–Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

One of the 42 studs that hold the Shippingport* reactor's top head to its shell section...

This stud must not fail... that's why it's 4340 Nickel Alloy Steel

Forty-two studs, just like the one shown above, are being used to fasten a nuclear reactor's top head to its shell section.

Each of these studs is made of 4340 nickel-chromium-molybdenum alloy steel for essential strength and toughness. Stud tension required to maintain leakproof contact of head to shell is 40,000 psi.

In nuclear reactors as studs, or in steel mills as heavy-duty gears, or in rotary shears as shafts 4340 Nickel alloy steel proves again and again that it gives the best combination of strength, toughness, ductility, and resistance to fatigue. Performance proves that 4340 gives the properties which are best suited for moderate-to-heavy section parts.

Performance on these jobs also proves that AISI 4340 responds reliably to all forms of heat treatment. In the stud shown above, for example, 4340's ability to be hardened easily throughout large sections was of tremendous value. And its ability to be machined *after* heat treatment was valuable in thread cutting.

The high hardenability of this Nickel alloy steel, its machinability as heat treated up to 340 BHN, can prove valuable to you, too.

Why not look into the possibilities of 4340 Nickel alloy steel? Most Steel Service Centers throughout the country carry this steel in stock—will make deliveries on a "next door" basis. Write Inco for a list of Steel Service Centers stocking 4340 Nickel alloy steel. A postcard will do it.

*Shippingport Nuclear Power Station. Operated by Duquesne Light Company. Designed by Westinghouse Electric Corporation. Reactor Vessel designed and manufactured by Combustion Engineering, Inc.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

Buy It: You're Paying for It!

In surveying the capital equipment spending plans of the metalworking industry, STEEL's editors have come up with this conclusion: An upturn is taking place that could well expand to boom proportions in 1960. (See Page 56.)

Anticipated purchases of metalworking equipment this year are about 30 per cent ahead of 1958's, even with 1956's, and only 12 per cent below 1957's. Some $4.85 billion is expected to be spent on material handling, joining and assembly, machining, forming, heat treating, cleaning and finishing, testing and inspection, foundry, and steelmaking equipment.

Significantly, purchases in the second half will be 36 per cent better than they were in the first half.

The reasons for the upturn are obvious:

The recovery from the 1958 recession has been faster than most people anticipated, and money from profits is more freely available.

Plant capacity that appeared excessive only a few months ago is turning out to be inadequate.

Rapid advances in research and development are changing management's concept of obsolescence. Previously, a piece of equipment was regarded obsolete only after it wore out. Now even new equipment is termed obsolete the minute it can be replaced by something better.

Widespread increases in wages and fringe benefits are forcing management to take a new look at equipment in use in terms of unit production costs and their effects on future profits.

Assume that you pay $24 a day for one man to operate a 15 year old machine which processes only 120 parts.

For the same $24 he can turn out 960 parts a day on a new machine.

Direct unit labor cost is sliced to a thin fraction of the previous cost, even after allowing for amortization.

It means that you may already be paying for a new machine in the form of lost sales and lost profits.

So why not buy it?

Irwin H. Such

EDITOR-IN-CHIEF

TV cameras, transmitters and receivers, punched card programming, electronic brains . . . Inland's new 46" Universal automatic slabbing mill is a far cry from the mills of yesteryear. At his fingertips, today's mill operator—Inland Slabber . . . 1959—has power and precision control never before achieved. Currently fed from six soaking pit batteries, this giant, new slabbing mill operates at a capacity of 1,800,000 tons per year. As primary and finishing capacity grows in response to Inland's continuous plan for expansion, this mill, built with an eye to future requirements, can draw upon more than three times as many soaking pits—step-up its capacity to a tremendous 4,000,000 tons. For soaring mid-western industry, this means an always dependable source—producing more uniform steel of highest metallurgical quality, at ever-increasing speed.

Building Today, With an Eye to Tomorrow

INLAND SLABBER . . . 1959

INLAND STEEL COMPANY
30 West Monroe Street • Chicago 3, Illinois
Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

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JOSEPH T. RYERSON & SON, INC.
INLAND STEEL PRODUCTS COMPANY
INLAND STEEL CONTAINER COMPANY*
INLAND LIME & STONE COMPANY* *Division

Steel Users Ready for Anything

Extension . . . Settlement . . . Strike?

MOST STEEL consumers are loaded with the metal. They're ready for a strike, peaceful settlement, or another extension in the big labor dispute.

A STEEL survey (see accompanying exhibit) reveals that 38 per cent of metalworking took advantage of the steel contract extension to July 15 to remedy inventory shortages. "The two weeks of grace were a godsend to us," says a supplier for American Motors Corp.

• **Spot Shortages Remain**—They're most common in specialty products. For example, a west coast aircraft company is apprehensive about the supply of alloy steel plates for missile motor cases. It is polling Canadian steel mills to see whether they can supply the material.

The fact that 78 per cent of the survey respondents would not cancel orders on mills' books if we get a peaceful settlement indicates this: Many users still do not have their inventory affairs in perfect shape even though they are prepared to weather fairly severe storms. The unexpectedly good business led many consumers to chew up more of the metal than they had anti-

How do inventories stand now?

	% of Respondents Reporting			
	Under 30 Days	30-60 Days	60-90 Days	3-6 Months
Hot rolled carbon bars	15%	37%	24%	24%
Hot rolled alloy bars	19%	24%	33%	24%
Cold finished bars	19%	19%	36%	26%
Hot rolled sheets, strip	13%	35%	39%	13%
Cold rolled sheets, strip	13%	31%	37%	19%
Light & heavy plates	18%	38%	22%	22%
Structural shapes	..	62%	14%	24%
Welded tubing	18%	38%	19%	25%
Seamless tubing	17%	34%	22%	27%

If no strike, will inventories be excessive?

NO say 56%

YES—33%

SOMEWHAT—11%

If no strike, would you cancel orders on mills' books?

NO say 78%

YES—11%

WILL DEFER—11%

cipated earlier this year when they made their steel buying plans.

• **Well Prepared, Generally**—Despite the spot difficulties, metalworking is probably better set now for work stoppages in steel than at any other time. Steel stocks today, estimated at more than 21 million tons, are some 4 million under what they were at the start of the 1956 steel strike, but inventories are thought to be in better balance than they were three years ago.

Supporting that belief are the inventory positions product by product as reported to STEEL (Page 51). An unusual uniformity is shown.

• **Role of Inventories**—"Well balanced steel stocks have been one of the silent weapons for industry in these negotiations," says a labor observer. In all other steel parleys since World War II the pressure from customers for metal has influenced steelmakers to sign with the United Steelworkers, several times leading to settlements that proved much too expensive.

This time, the industry negotiators know there will be much less pressure in case of a strike. Besides the good inventory positions, steelmen months ago got backing for their position from some of the major consumers, particularly the auto and electrical companies. The auto firms' tough tactics with the United Auto Workers last year might be considered a dress rehearsal for the drama in steel this year.

• **Meaning of 'United'**—The "united" front we've heard so much about in steel has double meaning—the industry is united internally on how it should deal with labor, and it has the united support of many steel consumers.

Of course, "united" is a relative term. A small minority of steel company officials thinks the majority is trying for too much. Not all users think the industry's approach is practical. STEEL has found a handful of consumers who candidly admit they think steelworkers should get a fairly good boost so prices could be raised. Then the consumers would have an excuse to raise their own quotations.

• **Majority Rules**—But the majority's position still held last week: No net increase in employment costs.

The most likely basis of settlement, as of last week: Higher wages might be offered the United Steelworkers if the union would agree to contract changes which would permit greater efficiency in steelmaking.

USW President David J. McDonald vetoed the proposals when they were first made early in June, and in early July he was still calling them a break-the-union program. He also said he would "not recommend another contract extension under the same circumstances" that existed when the first extension was agreed to just before the original June 30 strike deadline.

The steel firms renewed their offer to extend the contract indefinitely, with a ten day termination provision.

Steel Imports

The balance of trade in steel products . . .

In APRIL, 1958, the U. S. . . .		
EXPORTED		IMPORTED
NET TONS		NET TONS
266,943	**vs.**	**114,024**
In OCTOBER, 1958,		
251,410	**vs.**	**200,569**
In DECEMBER, 1958,		
169,508	**vs.**	**230,599**
In APRIL, 1959,		
178,029	**vs.**	**359,450**

Imports of steel mill products by the U. S. set a monthly record during April and exceeded exports for the fifth consecutive month, American Iron & Steel Institute figures show.

The April import total was 359,450 net tons, vs. 287,417 tons this March and 114,024 tons in April, 1958. U. S. exports of steel mill products in April totaled 178,029 net tons vs. 177,901 tons this March and 266,943 tons in April, 1958.

Steel imports in the first four months of this year set a record (1,117,005 tons). In the same period, exports (684,891 tons) were the lowest they've been in 20 years.

Dollar value of the April imports hit $37,533,358, says the institute. Total for the first four months of this year: $119,097,579.

Aluminum Talks Begin

Negotiations between the United Steelworkers and the three major aluminum companies in the U. S. got underway in New York July 7.

Chances for a peaceful settlement are better than they are in steel. Terms will closely parallel those in steel, so negotiators will probably be marking time until the steel pact is written (STEEL, July 6, p. 40). Although the nonferrous contracts being discussed expire July 31, odds are for an extension if a steel contract has not been agreed upon by then.

Bargaining with Aluminum Co. of America is going on at the Roosevelt Hotel. More than 16,000 workers are involved at plants in Alcoa, Tenn.; Badin, N. C.; Bauxite, Ark.; Bridgeport, Conn.; Detroit; Edgewater, N. J.; Mobile, Ala.; New Kensington, Pa.; Richmond, Ind.; Pt. Comfort and Rockdale, Tex.

Negotiations with Reynolds Metals Co. are in Reynolds' New York office building. Involved are about 8000 employees at Alexander, Ark.; Arkadelphia, Ark.; Bauxite, Ark.; Birmingham; Corpus Christi, Tex.; Malvern, Ark.; McCook, Ill.; Memphis, Tenn.; Phoenix, Ariz.; and Troutdale, Oreg.

Kaiser Aluminum & Chemical Corp. negotiations are also at the Roosevelt. In the July 31 contracts, USW represents 7500 at Belpre, Ohio; Dolton, Ill.; Grammercy, La.; Halethorpe, Md.; Heath, Ohio; Newark, Ohio; Ravenswood, W. Va.; Spokane, Wash.; Tacoma, Wash.; and Trentwood, Wash.

Senators Bible (left) and Smathers head . . .

Two Subcommittees to Hear Depreciation Problems

SEN. GEORGE SMATHERS (D., Fla.) AND SEN. ALAN BIBLE (D., Nev.) are two representatives in Washington ready to listen to your depreciation problems. Hearings by Senator Smathers' Government Procurement Subcommittee and Senator Bible's Taxation Subcommittee (they're tentatively scheduled to start the week of July 20) are the first designed to air small business' troubles with the Internal Revenue Service's infamous Bulletin F. Both subcommittees are parts of the Senate Small Business Committee.

• **Witnesses Lining Up**—Hearings will probably last only one day, but a committee source says the record will be kept open for written opinions of small manufacturers. At least three of the witnesses will be tax experts. Two others will probably be small subcontractors in the defense business, where Senator Smathers' subcommittee has had so much experience.

A spokesman describes the hearings as a "study" and admits they are aimed to "stimulate" the interest of Rep. Wilbur Mills's Ways & Means Committee. Mr. Mills will get into depreciation in his study of the tax system next November but has not made clear how thorough an analysis of depreciation he will have time for.

• **Special Interest**—While recognizing the significance of depreciation to all industry, the Small Business Committee's counsel, Wiley Messick, suggests it is of special interest to small businesses because they lack "ready access to the securities markets." When something new in capital equipment comes along, large firms can finance themselves easily, while small manufacturers have to wait for reserve funds.

It's too early to say whether the joint subcommittee hearings will bring any new information to light. But depreciation people in Washington are pleased that they will be held. "Anything that serves to focus attention on the problem at this time is good," says one. The hearings will cover capital equipment in general, not just machine tools, which the Small Business Committee previously examined.

A spokesman for Senator Smathers suggests the theme of the hearings: "The problem of trying to grow with current dollars when a small firm is operating under depreciation rules more than ten years old." Senator Smathers expressed interest in small business problems recently in a letter to the Small Business Administration in which he asked for another SBA office in Florida. Some 700 new manufacturing plants were built in the state last year, over 3000 in the last five years.

• **Defense Contract Angle** — The senator has received testimony that small subcontractors in defense business are unable to compete for Pentagon contracts when their equipment is not up to date, while larger firms, especially in the aircraft field, may get the latest equipment furnished by the government.

• **Small Business Only?** With Senator Smathers shooting at defense subcontracting and Senator Bible covering the more general aspects of capital equipment problems, the hearings seem certain to get the small manufacturer's viewpoint firmly before Congress. One Washington tax expert warns, however, that witnesses could do their long range cause harm by emphasizing small business too much. "Depreciation is a right, not a privilege," he contends. The fact that large firms may be able to obtain money for new equipment faster than small companies is really beside the point, he believes, although current depreciation policies may hit small business "with special rigor."

Other Washington observers think the attack can prove especially successful if enough legislators can be convinced that small business is in dire need of help. Then the fact that reforms would also benefit larger companies would be overlooked. Any depreciation reforms are certain to be fought by some union dominated elements of Capitol Hill as a "giveaway" anyhow.

Army Likes Piggyback

Putting loaded trailers on flatcars reduces freight handling costs $6 per ton for a 10 ton trailer load over a distance of 300 to 400 miles.

estimates the Army Transportation Corps. In recommending "piggyback" operations for the military, the corps cited these other advantages on the basis of a study: Low basic rail costs, less pilferage and handling damage, reduced fuel requirements, and an increase in logistic potential by revitalizing rail transportation.

Manganese Project Begun

The World Bank has loaned $35 million for the development of high grade manganese deposits in the Gabon Republic, French Equatorial Africa. The money will help finance equipment and services for mining operations, a 45 mile cableway, and a 180 mile railway connection to transport ore to Pointe Noire, an Atlantic port in the Congo Republic. First ore shipments are planned for mid-1962. Initial production will be 500,000 tons annually, a fraction of estimated reserves.

The loan was made to Compagnie Miniere de l'Ogooue (COMILOG), a Gabon corporation. U. S. Steel Corp. is the chief stockholder (49 per cent).

After the Afterburners

Chrysler Corp. and Thompson Ramo Wooldridge Inc., are beginning a joint project to bring an exhaust afterburner device to the production stage. It will reduce unburned hydrocarbons and carbon monoxide in exhaust systems. California is planning legislation to require such units on automobiles after 1961.

The current prototype of the Ramo-Wooldridge afterburner can remove about 90 per cent of the unburned exhaust hydrocarbons.

Czechs Start Steel Center

Work has begun on one of the largest integrated steel plants in Europe—it's near Kosice in eastern Czechoslovakia. The project is part of a plan to transform what was once one of the most backward areas in Europe (Slovakia) into a new industrial center.

Kosice lies between the Soviet iron mines at Krivoi Rog, Ukraine, and the Czechoslovak coal region of Morava Ostrava. The facility will have a coking plant with four batteries said to be equal in capacity to the ten now operating in Morava Ostrava. It will also have a chemical plant for the reduction of gases.

The Kosice project, plus expanded capacities at older Bohemian and Moravian mills, is expected to boost the country's steel tonnage from 5.2 million tons in 1957 to 9.2 million tons in 1965.

Battelle Studies Uranium

The Atomic Energy Commission is sponsoring a study of industrial uses of depleted uranium. (Most of the fissionable U-235 has been removed. The material is available as uranium hexafluoride and may be processed to the metal, oxide, or any desired compound.)

Uranium and its compounds had limited uses prior to World War II —as a coloring agent in glass and glazes, as a component in some ferrous and nonferrous alloys, and as a chemical agent in photographic films, negatives, and prints.

About 100 tons were consumed annually for such applications before wartime restrictions prohibited them.

Organizations contemplating usage are invited to make such information available to the survey team at Battelle Memorial Institute, Columbus, Ohio.

THIS IS THE HEART OF AN ATOMIC CLOCK that'll be put into orbit about the earth to check a part of Einstein's theory. If he was right, the clock will be "slower" than one on earth. It is being developed by Hughes Aircraft Corp., Culver City, Calif., under contract with the National Aeronautics & Space Administration

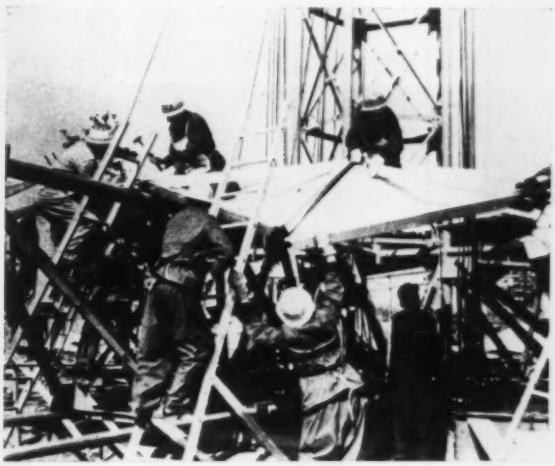
Plans $2 Million Plant

Thompson Ramo Wooldridge Inc., Cleveland, will construct a $2 million plant at Anaheim, Calif., for the West Coast Div. of the Tapco Group. It will assume most of the operations of Tapco's present Bell and Long Beach, Calif., plants when completed next February. The plant will include a 13,000 sq ft office building, a 4000 sq ft research and development building, and a 104,000 sq ft manufacturing building. Facilities will include a dust-free section for precision assembly and low contaminant testing, and a temperature controlled room for close tolerance work on highly sensitive metals. Products will include hydraulic hardware for aircraft and missiles, structural members for aircraft, and rocket motor cases for missiles. George Stewart is West Coast Div. manager.

Raising the Roof in Russia

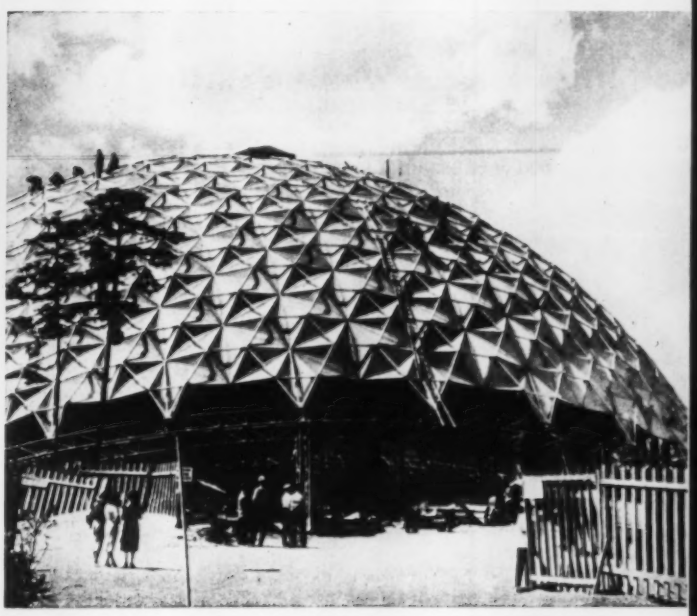
Even Premier Khrushchev took a look at the gold anodized, Kaiser aluminum geodesic dome, the biggest ever erected. It'll house part of the American National Exhibition in Moscow's Sokolniki Park. The dome is 200 ft in diameter, has 1110 diamond shaped panels, and weighs 104,000 lb

Fourteen panel sizes are formed by Russian workmen on a hastily imported U. S. brake press . . .



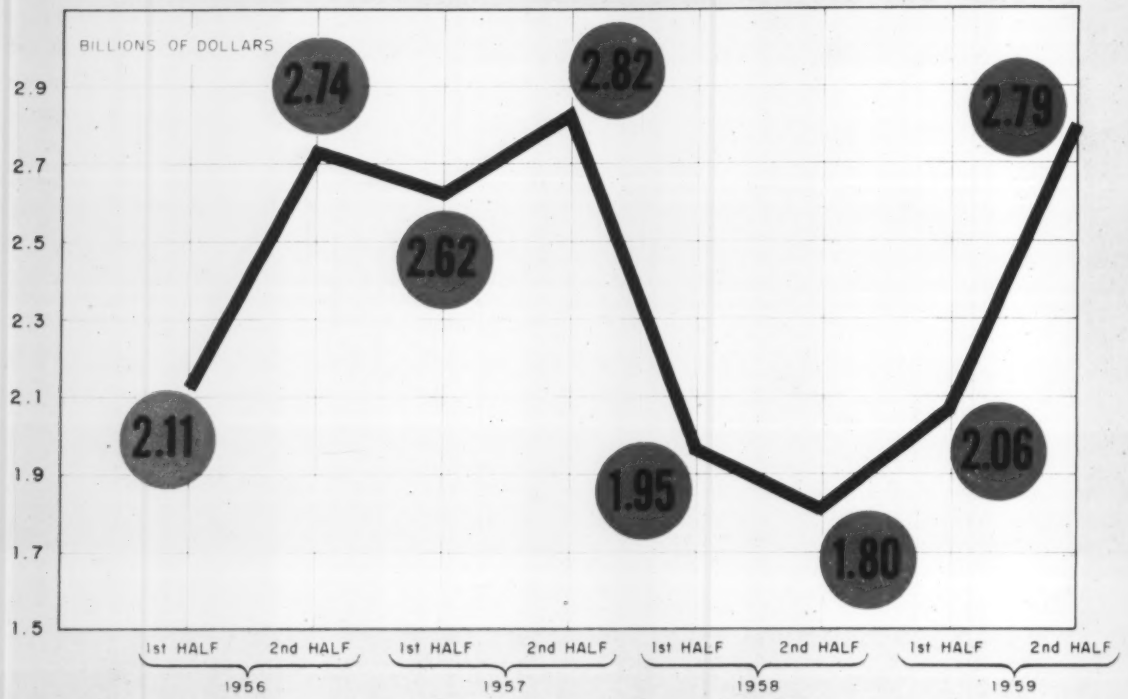
Workmen join panels in concentric rings around central mast used to raise dome above its supporting struts . . .

Dome is gradually raised as more rows of panels are added. Panel area is 30,000 sq ft . . .



Completed dome will be the focal point of America's exhibit this summer

Metalworking's Capital Equipment Outlays



THE BOOM BEGINS

How Forecast Was Made... How You Can Use It

STEEL surveyed a group of judiciously selected companies that represents nearly one-third of metalworking's capital equipment spending. The firms reported their dollar outlays for each of nine classes of equipment in 1959's first half—and they told STEEL their confidential plans for spending in the coming six months.

On this and the next three pages, you'll find the first results of this survey. In the next issues of STEEL, you'll find reports on the outlook for individual equipment producing industries. This new STEEL study, the first of its kind, will be conducted semiannually—the next one in January, 1960.

It's a new management tool that you can use. The editors of STEEL believe that the trend in purchases of capital equipment is one of the best indicators of metalworking's future business trend. This survey was limited to equipment (it excludes spending for plant) to achieve a more accurate indicator of the short term business outlook.

You can use this survey...

- In your market research and sales forecasting.
- In your analysis of the business trend for the coming year.
- To compare your company's capital equipment spending plans with the average for your industry and for all metalworking.
- To see where strong spots are developing in the economy.
- As a marketing guide—if you sell capital equipment or supply the capital goods industries.

METALWORKING is at the threshold of a new capital spending boom. The industry threatens to crash through the door by yearend.

It will spend $2.79 billion for capital equipment alone during the second half (vs. $2.06 billion in the first half), indicates a new STEEL survey (for details, see left). That's more than in any previous six month period, except the latter half of 1957. It's only $30 million short of a record.

The survey results indicate that metalworking will spend nearly 36 per cent more for equipment in the coming six months than it did in the first half. The industry will spend about $1 billion more than

How Industries Will Boost Spending For Capital Equipment . . .

(Percentage increases, 2nd half, 1959, vs. 1st half)

Aircraft	Up 71%
Automotive	Up 91%
Electrical Machinery & Equipment	Up 79%
Farm Equipment	Up 77%
Iron & Steel Foundries	Up 71%
General Industrial Machinery[1]	Up 31%
Special Industry Machinery[2]	Down 32%
Steel	Up 26%
Metalworking Machinery	Up 4%
Nonferrous	Up 26%
Railroad Equipment	Up 30%

1. Includes manufacturers of pumps, compressors, elevators, conveyors, industrial trucks, industrial furnaces and ovens, and others. 2. Includes producers of textile machinery, woodworking machinery, paper industry machinery, printing machinery, and others.

it did during the last half of 1958. It signals record outlays for capital equipment in 1960.

• **Behind the Upturn**—Here are the main reasons for the biggest capital spending upturn in recent years:

• Metalworking's recovery was faster and stronger than anyone anticipated. New records were chalked up less than a year after the recession's bottom was reached.

• Spiraling labor costs continue to force companies to invest in labor saving machinery.

• Metalworking's profits have come back to near record levels after a long depressed period. This permits the unleashing of money to satisfy a pent up demand for new equipment.

• Price fighting continues in many industries. This fierce competition shows few signs of relaxing. Result: Many companies are resorting to the purchase of more efficient equipment to lower their unit production costs in an effort to remain competitive.

• Some industries that were crying about excess capacity last summer now find that they'll have to expand to meet the needs of the soaring sixties.

• **Gleeful Builders**—It spells total recovery for recession battered producers of capital equipment. All equipment making industries—and their suppliers—will benefit (see Pages 58, 59).

For the machine tool industry, it signals a $360 million second half (vs. an estimated $290 million first half).

Makers of testing and inspection equipment can expect the biggest percentage gain. The respondents indicate they'll spend 69 per cent more for that type equipment in the second half than they did in the first.

Press manufacturers can look for the smallest increase—11 per cent. Excess press capacity in many industries causes this segement to lag a little behind the general purchasing trend.

Many large new heat treating programs give producers of such equipment this excellent prospect: 46 per cent more sales in the second half than in the first. The aircraft industry is turning more and more to adhesive bonding and brazing, which requires the purchase of new heat treating equipment instead of conventional joining facilities.

• **Big Spending Buyers**—The automotive industry is leading the field in loosening purse strings. It will spend 91 per cent more in the second half than it did in the first. A partial explanation for the big increase is that the industry's first half outlays were meager. Another reason: Cars are selling well, and forecasts are uniformly optimistic. So automotive partmakers figure this is a good time to modernize. Auto industry profits are high, permitting capital expenditures. And labor costs continue up, demanding more efficient equipment.

The reviving aircraft industry, with its booming missile segment, will spend 71 per cent more for capital equipment in the second half than it did in the first. It promises to be an excellent market for makers of cleaning and finishing equipment, testing and inspection equipment, machine tools, and heat treating equipment. Several aircraft firms have huge heat treating projects planned.

The electrical machinery and equipment industry is entering the market place like a woman with a sudden windfall. It will boost spending for every major type of capital equipment. Better prospects for appliance sales plus stronger inquiries for industrial equipment are causing firms in this category to get set for high production. And price competition in many lines brings a need for lower unit production costs that can be achieved only with modern equipment.

Foundries, finally recovering from a deep and prolonged recession, are also planning big increases in capital spending. And they're answering demands for closer tolerances and more uniform quality by more than doubling outlays for testing joining and assembly equipment.

The steel industry is using a large

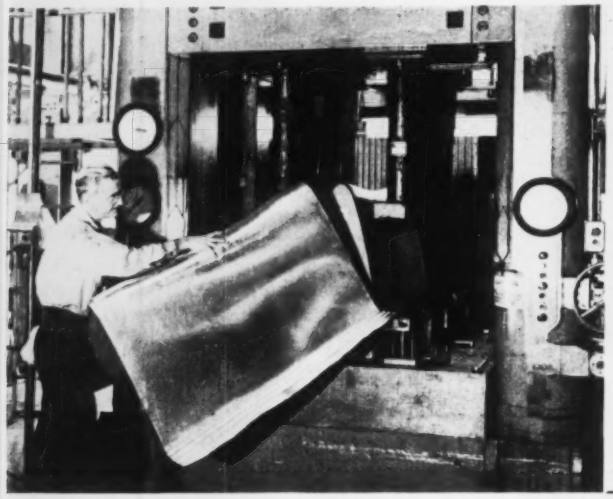
What Equipment They Will Buy . . .

MACHINE TOOLS

Up 24% in 2nd half vs. 1st

Analysis by consuming industries

Aircraft	22% more
Automotive	68% more
Electrical Machinery & Equipment	102% more
Farm Equipment	15% more
General Industrial Machinery	23% more
Special Industry Machinery	28% less
Metalworking Machinery	12% less
Steel	11% less



PRESSES

Up 11% in 2nd half vs. 1st

Analysis by consuming industries

Aircraft	9% more
Automotive	40% more
Farm Equipment	4% more
Electrical Machinery & Equipment	56% more
Steel	6% less

segment of its profits for new capital equipment. Several medium size steelmakers are spending 50 per cent more in the second half than in the first. Many larger ones are boosting outlays 25 per cent or more.

The only industry surveyed by STEEL that plans to spend less for equipment in the second half than it did in the first is the special industry machinery group. Those firms supply the textile, woodworking, paper, printing, and other nonmetalworking industries where the business cycle differs somewhat from that of metalworking.

Nonferrous companies, led by aluminum producers and fabricators, will spend 26 per cent more for equipment in the coming six months than they did in the first half. It means that they may finally join the upward trend in capital spending. They've lagged since the recession.

Producers of industrial machinery told STEEL they'll spend 31 per cent more in the second half than in the first. They're allocating much of their money for material handling equipment, machine tools, and joining and assembly equipment.

The metalworking machinery industry, in which machine tool builders are predominant, will spend only 4 per cent more in the second half than in the first. They'll spend less for machine tools. One reason: While demand for their products was lagging, they built equipment for their own use.

STEELMAKING EQUIPMENT

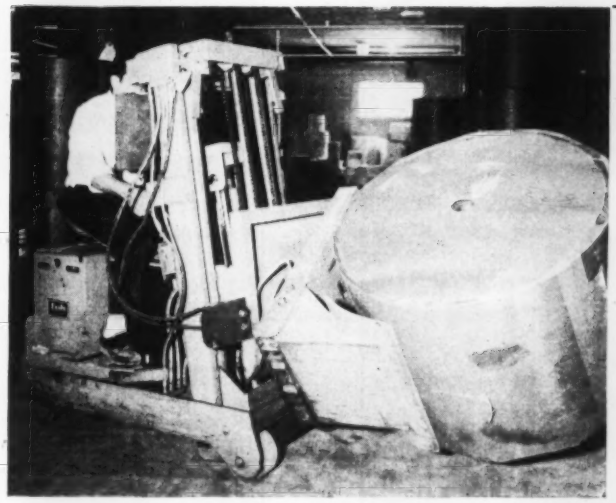
Up 43% in 2nd half vs. 1st

FOUNDRY EQUIPMENT

Up 39% in 2nd half vs. 1st

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

and How Much . . .



MATERIAL HANDLING EQUIPMENT

Up 28% in 2nd half vs. 1st

Analysis by consuming industries

Aircraft	1% more
Automotive	42% more
Electrical Machinery & Equipment	9% more
Foundry	44% more
General Industrial Machinery	73% more
Special Industry Machinery	15% less
Metalworking Machinery	16% less
Steel	31% more

TESTING & INSPECTION EQUIPMENT

Up 69% in 2nd half vs. 1st

Analysis by consuming industries

Aircraft	56% more
Automotive	84% more
Electrical Machinery & Equipment	34% more
Foundry	109% more
Metalworking Machinery	27% less
Steel	12% more

CLEANING & FINISHING EQUIPMENT

Up 41% in 2nd half vs. 1st

Here's how the industries surveyed by STEEL plan to boost spending for cleaning and finishing equipment in the second half:

Aircraft	Up 77%
Automotive	Up 59%
Electrical Machy. & Equip.	Up 29%
Farm Equipment	Up 21%
Foundry	Up 12%
General Industrial Machy.	Up 19%
Steel	Up 41%

HEAT TREATING EQUIPMENT

Up 46% in 2nd half vs. 1st

The aircraft and missile industry will show the biggest gain. It'll buy more than twice as much heat treating equipment in the second half than it did in the first. Other good markets for the second half will include the farm equipment and foundry industries. The auto, machinery, and steel industries will buy about the same amount as they did in the first half—slight declines are possible.

JOINING & ASSEMBLY EQUIPMENT

Up 32% in 2nd half vs. 1st

Biggest second half buyers will be these industries: Automotive (about 40 per cent more than in the first half), electrical machinery and equipment (about 30 per cent more), and metalworking machinery (about 30 per cent more). Producers of general industrial machinery indicate they'll buy slightly more in the second half than in the first. The aircraft industry will be a big buyer of facilities for brazing and adhesive bonding.

States Fight for Defense Dollars

"A POLITICIAN'S first duty is to get re-elected" runs one of Washington's favorite sayings. So keep your eye on efforts in Congress to guarantee that a "fair share" of Uncle Sam's dollars will be spent in each of the 50 states and that no state will get a disproportionate share.

The New York Congressional delegation, for example, has instituted a nonpartisan drive to bring its state a bigger share of the defense dollar. The strategy is particularly directed against California. And West Virginia, which may or may not have legitimate grievances, is wondering why it has only an $8 million annual federal payroll, while Ohio, with about four times the population, has a federal payroll of $290 million.

Keenest interest is in the $40 billion the Pentagon spends a year.

Javits-Keating Bill Is a Straw Man

New York Republican Senators Jacob Javits and Kenneth Keating have brought the states' struggle for the defense dollar out into the open with S. 1875, the Armed Services Competitive Procurement Act. It would force the services to consider the "strategic and economic desirability" of spreading dollars among the states.

The bill stands little chance of receiving a hearing by the Senate or House Armed Services Committees, but it does serve notice on the Pentagon to mind its Ps and Qs when passing out contracts.

Note that of late New York has been losing to California. In the Korean period (1950-53), New York's share of the defense dollar was 15 per cent. As the missile age dawned (1955-58), it fell to 12 per cent. Because of the smaller defense budget, the dollar drop-off has amounted to almost 50 per cent. California boosted its share in the same two periods from about 13.5 per cent to more than 20 per cent.

Denying that S. 1875 is simply a means to give some of California's contracts to New Yorkers, Senator Keating argues the bill continues the modifications Congress has already made in procurement legislation to see that a fair share gets to small businesses and that labor surplus areas receive special attention.

Competitive Negotiation Is Emphasized

Of interest to all defense contractors is the formula the bill establishes for competitive negotiations between the Pentagon and contractors. Where contracts are awarded through negotiations rather than competitive bidding, the bill states that at least two sources must be notified, and that if the low bidder does not receive the contract, unsuccessful bidders will get an explanation.

Following the lead of the Saltonstall Bill, S. 1875 also asks that contracts be awarded with "performance" specifications stated, not design specs, so that the contractor may have as much leeway as possible for efficient work.

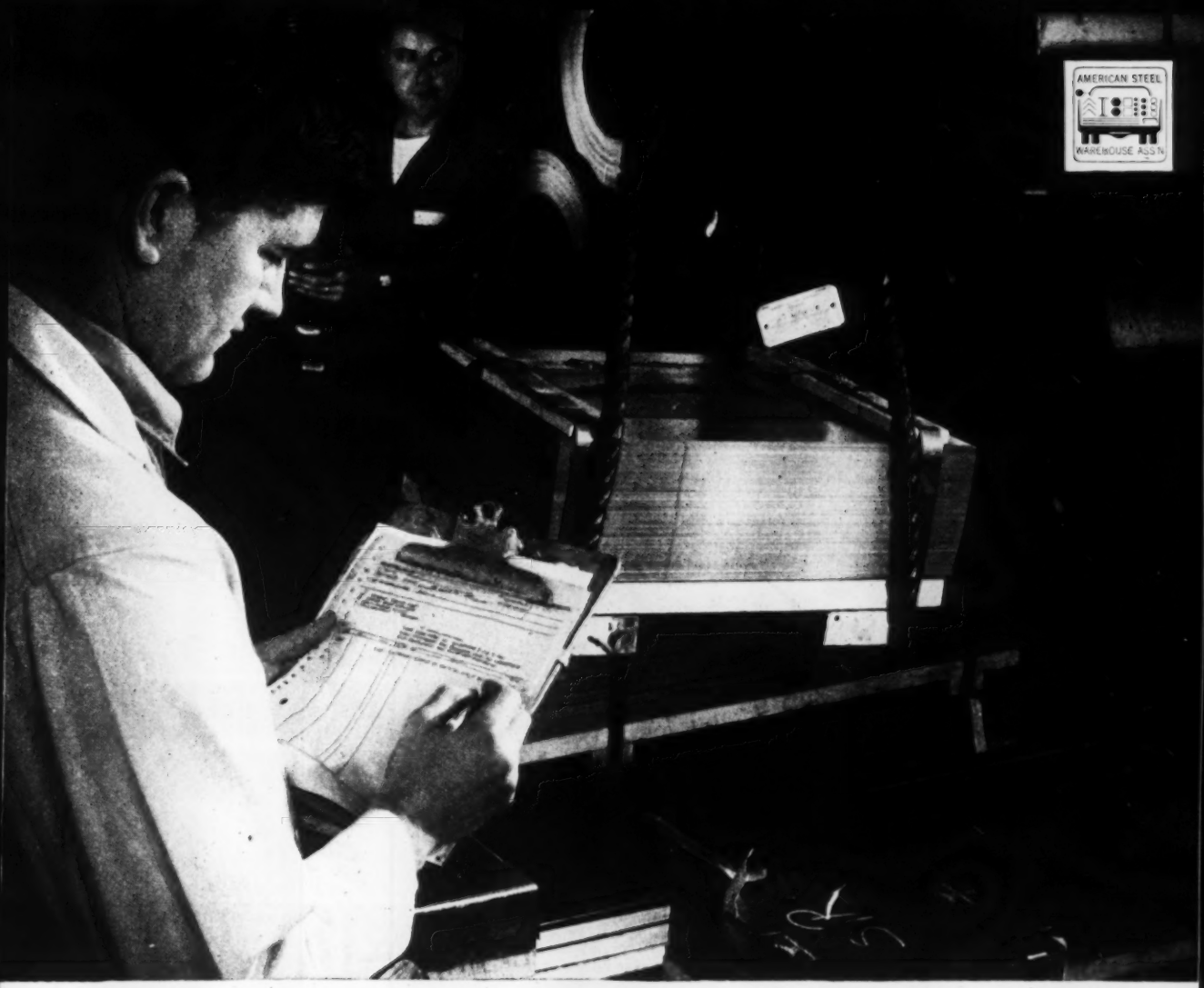
Prediction: The bill itself will get nowhere. Its theme will serve to focus increasing Congressional interest on defense procurement. You can look for more such bills in the future with a correspondingly healthy effect on the Pentagon's activities.

Negotiation: Really Competitive?

The Puzzle Palace (the Pentagon) is also taking its lumps from an old and familiar critic, Rep. F. Edward Hebert (D., La.). His Special Investigations Subcommittee sent out 3000 questionnaires to retired military personnel and defense contractors to learn how many men have "moved to the opposite side of the desk" and exactly what relations they have with their old services.

Hearings began last week with a disclosure by the Navy that it may have 300 conflict of interest cases. It recently questioned some 4600 retired Naval officers about their civilian relations with the Pentagon.

Involved is a claim by many congressmen that ex-military personnel, particularly of high rank, should be barred from employment by military contractors for up to five years after they retire. Again, Washington sources don't expect any legislation to come of this investigation, but it may serve to sharpen the tools of negotiating defense contracts and avoid what might be termed "poor judgment." "Influence peddling," per se, is difficult to pin down, unless you have something as obvious as a Deepfreeze or a vicuna coat.



Typical J & L Steel Service Center scene showing how sheet metal is banded, sealed and handled to prevent damage.

Extra Care at "The Department Store of Steel" prevents damage...saves you time and money

● Any way you look at it, it takes your time and costs you money when you receive damaged steel that delays your production. To prevent such a situation, your J & L Department Store of Steel makes *extra care* a standard practice in processing every order.

On orders for sheared sheets, for example, J & L warehousemen handle sheets with sheet lifters instead of hooks, shear squarely and accurately, package tightly with bands and seals instead of wire, protect corners and edges, and tag each unit securely with complete data for your ease of identification.

Extra care is practiced in all departments by all personnel in the handling of every order—at no extra cost to you. Call your J & L Steel Service Center for your next steel requirement and see how *extra care* can save you time and money.

J & L Steel Warehouse Division

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JL
The Department Store of Steel

Got a problem that calls for thread-cutting screws?

PARKER-KALON offers three new, improved thread-cutting screws for every application in every material

1 New, Improved P-K Type F*

. . . hardened thread-cutting screws developed for use in friable, granular or brittle material. The pilot, with its five tapping flutes, cuts a machine screw thread as the screw is turned in. The Type F is ideal for making fastenings to ferrous and non-ferrous castings, bronze or brass forgings, heavy gage sheet metals, structural steels, plastics and resin-impregnated plywood.

2 "Pentap"... the new, Improved P-K Type B-F*

(formerly F-Z) combining the five thread-cutting flutes of the Type F screw with the coarse-pitch, widely-spaced threads of the P-K Type B. The thread-cutting "Pentap" Type B-F distributes cutting pressure evenly, lets chips drop to the bottom of the hole, and prevents cracking of material. It is designed for making fastenings to comparatively thin sections and bosses in friable and brittle plastics.

3 P-K® Type L†

. . . is a completely new and improved thread-cutting screw developed by Parker-Kalon especially for use in Nylon. The Type L functions as a combination thread-cutting and thread-forming screw in that it cuts a small amount of the Nylon to allow the full diameter threads to form. Type L offers a particular advantage in Nylon assemblies which must be disassembled for service, because *the P-K Type L can be removed and replaced without stripping or galling.*

The five cutting flutes on the new, improved P-K Type "F" and "BF" reduce pressure development by 80 percent! The completely formed threads on these screws have sharper cutting edges, and 5 deep flutes that are of continuous depth. These features make for better clearance of the accumulated material and assure minimum stresses in driving, and avoid the possibility of stripping or galling.

FOR SEMS . . . and Neoprene or Nylon washer **STAPS®** in thread-cutting and thread-forming tapping screws, or machine screws in any kind of pre-assembled fastener-washer combination, P-K can supply them, too!

KEEP AMERICAN INDUSTRY AT WORK . . . BUY P-K . . . MADE IN U.S.A.

*Patent Pending †U. S. Patent 2,350,346

FOR SAMPLES OF P-K THREAD-CUTTING SCREWS AND SEMS, CALL YOUR LOCAL P-K "BULK-STOCKING" DISTRIBUTOR

PARKER-KALON® fasteners

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, New Jersey • Offices and Warehouses in Chicago and Los Angeles

Domestic Manganese Program Falters

Ferromanganese alloy being poured at the Marietta, Ohio, plant of Union Carbide Metals Co., a division of Union Carbide Corp.

(Thousands of short tons)

Year	Domestic Mine Shipments	Ore Imports	Ore Consumption**
1958*	325	2,500	1,500
1957	366	3,105	2,361
1956	245	2,235	2,264
1955	287	2,088	2,110
1954	206	2,166	1,741

Source: Bureau of Mines.
*Estimated.
**Consumption will not equal domestic shipments plus imports. The government has an undisclosed amount of ore in stockpile.

THE U. S. is the world's largest consumer of manganese, yet it depends on foreign sources (Africa, Brazil, and India) for 85 per cent of its needs.

An emergency could shut off supplies of the strategic material, essential in the manufacture of steel. So emphasized J. Carson Adkerson, president, American Manganese Producers Association, Washington, before the House Committee on Interior & Insular Affairs. He asked for the General Services Administration to continue its "carload lot" program until a suitable long range program can be worked out.

• **Background**—To stimulate development projects in this country, the GSA began buying high grade ores from small producers in July, 1952. Price: $2.30 per long dry ton unit (22.4 lb), 48 per cent manganese base, in "carload lots," f.o.b. shipping points. Mr. Adkerson reported that 45 per cent of our domestic manganese production is under this program. Another 39 per cent is through special GSA contracts with large producers.

Although the program is scheduled to continue until June 30, 1961, it could be dropped by September or earlier. "This means the mines will be abandoned and allowed to collapse; plants will be scrapped; and experienced personnel will leave the mining areas," asserted Mr. Adkerson.

The Office of Civil & Defense Mobilization has been asked to continue accepting deliveries until the 1961 date. Approval has been refused on grounds that defense needs have been met. Mr. Adkerson countered: Why is the government contracting to obtain manganese from India in exchange for farm surplus goods?

• **Supply Situation**—Prior to 1950, we were receiving substantial amounts of manganese from Russia (which has over two-thirds of the world's known sources of good grade manganese). After the Soviets cut off shipments in 1949, it took several years and a lot of money to develop alternative supplies. Yet we continue to rely on distant sources, subject to political unrest, for our growing requirements, charged Mr. Adkerson.

• **Domestic Potential**—The U. S. has about 1 million tons of explored, but unmined, good grade ore (less than 1 per cent of the world's total). But it also has reserves of undeveloped low grade ores that could last 100 to 500 years.

The GSA program puts a 10,000-ton-per-year limit on small plants, which means they can't justify the installation of larger facilities. "In some cases, when the 10,000 tons are reached, the mines are sold or abandoned," commented Mr. Adkerson.

Many small operators will expand when conditions permit, he said, adding: We are already using processes which produce the highest grade concentrates or ore products in the world.

Manganese producers claim that domestic sources could supply at least half and possibly all the country's needs for years. They say the ore's price would not increase the cost of steel ingots as much as $1 per ton.

YOCAR

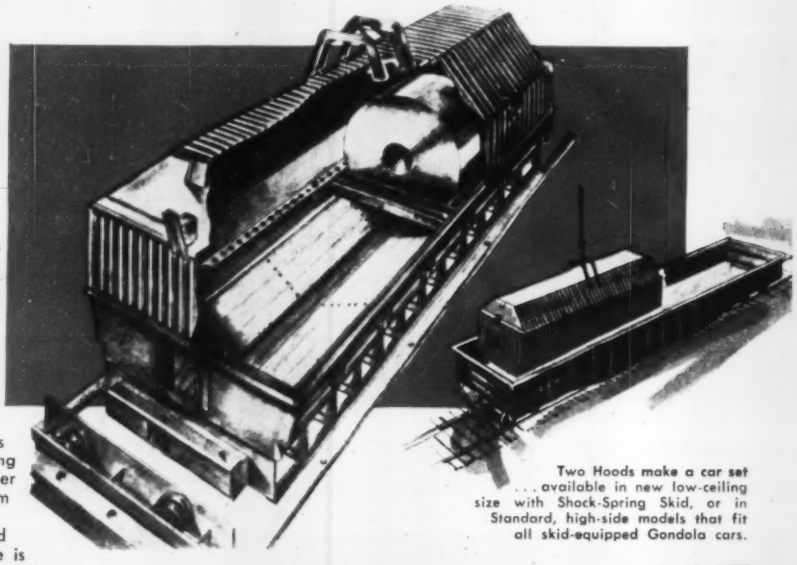
BRINGS RAILROADS AND SHIPPERS

... that lower shipping costs,

1

NEW Gondola Hoods with *Shock-Spring* Coil Skid

New, short-wall Yocar Hoods give greater protection . . . fit tighter, handle easier, even in low height-clearances. Balanced Lift Bracket makes lifting easy . . . storing convenient. NEW Shock-Spring COIL SKID has deeper coil-well for positive cradling . . . new-type cross-member Retainer Bar locks coils securely for maximum damage protection . . . Skid and Retainer Bar surfaces are Oak-lined for extra safety. Skid under-frame is all-welded steel construction with built-in inspection hatch; rugged shock-spring bracing at car ends cushions roughest "humping."

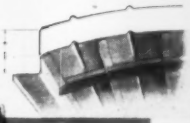


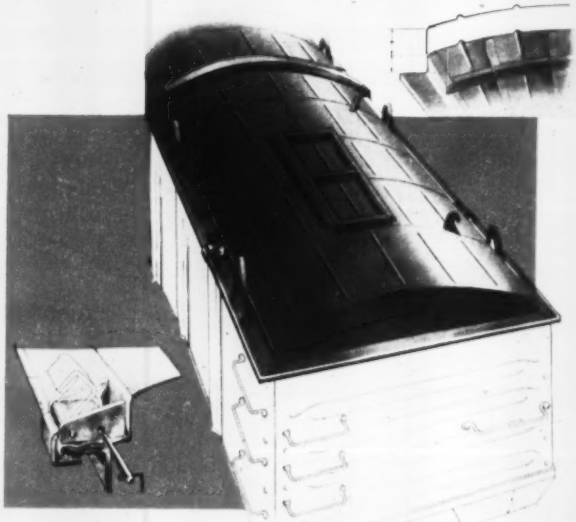
Two Hoods make a car set . . . available in new low-ceiling size with Shock-Spring Skid, or in Standard, high-side models that fit all skid-equipped Gondola cars.

2

NEW Gondola Roofs

Economical, these rigid, all-steel curved-top GONDOLA ROOFS are beaded for extra durability. Roof height is varied to meet A.I.S.I. 48-inch standards. Overlapping lip in center section fits to two adjoining end sections; better weather protection for steel bars, sheets, plates, tubing; rugged swing-out lock prevents catching, lowers maintenance cost; stack-easy brackets permit easier storing. Manway doors, catwalk, special height angles optional.





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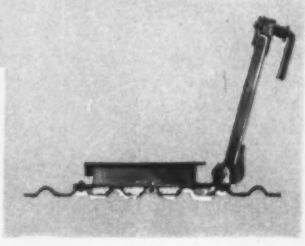
Door in locked position; fits roofs, hoods, containers regardless of types of surface.



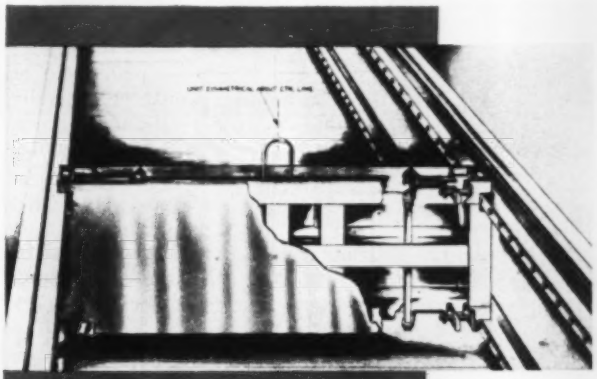
Door open shows seal application on beaded car surface.

NEW Manway Doors

Yocar's new low-cost inspection doors solve covered Gondola inspection problems . . . fit all types of car surfaces, apply to vertical or horizontal areas . . . minimize bad-order cars. Special foam rubber and rubber sealing gasket are completely weather-tight . . . spring-loaded locking handle is built to "take it."

FIVE NEW DAMAGE CONTROL DEVICES

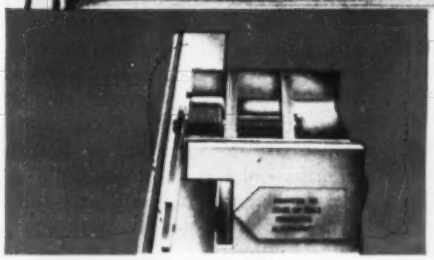
cut damaged shipments, save man-hours



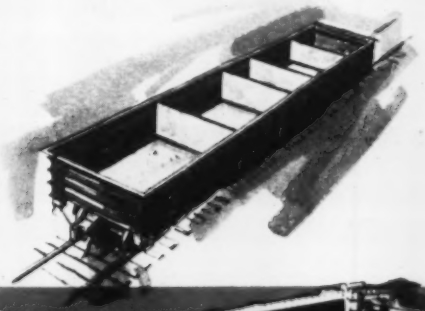
4

NEW RoLLoK Movable Bulkheads

. . . cut installation time in half with new "Zee"-section tracks at top and bottom of car walls; bulkhead positions easily on case hardened rollers; over-sized locking pins allow for car wall distortion . . . swivel crank operates locking pins quickly and safely. Meets A.I.S.I. standards . . . steel or wood facings available . . . bulkheads are in car sets to meet any requirement.



Eccentric rollers permit bulkhead to rest weight on applied "Zee" track . . . protecting against flat surfaces and bearing wear . . . this feature optional.



5

ECONO-GUARD

...low-cost steel anchor-wall liners

ECONO-GUARD adds years to car wall life . . . saves lift truck damage . . . gives extra car strength, keeping cars in service longer . . . provides greater damage protection to shipments with over 200 "Safe-Cargo" anchoring pins. Ask about SAFE-CARGO anchor belt rails for PIGGY-BACK trailers.

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GEARED TO PROGRESS
RPI MEMBER

YOCAR *SAFE-CARGO*
LOW-COST, POSITIVE DAMAGE CONTROL

YOUNGSTOWN STEEL CAR CORP.
NILES, OHIO

A quality name in railroad product engineering for more than forty years

Dept. DPF #1
Youngstown Steel Car Corp., Niles, Ohio

Please send your new Damage-Control booklet, "Clear Track to Clear Profits." We are interested in applications of these new devices.

Your name: _____

Title: _____

Company name: _____

Address: _____

City: _____ Zone: ____ State: _____

The Why, How of Labor's Quest for Job Security

JOB SECURITY and contract provisions to assure it are the major demands of the United Steelworkers.

"Security is labor's single biggest selling point to members and potential members today," says Raymond F. Vacha, director of industrial relations for Associated Industries of Cleveland. He negotiated 60 contracts in 1959's first half. "Practically all involved the security issue in some form."

• Workweek and seniority provisions in the contract are the chief routes labor travels toward more security.

"Look for unions to exert more and more pressure to shorten the workweek by various means and to try more and more gimmicks to tighten up on seniority," predicts Mr. Vacha.

• In the northeastern Ohio area, a bellwether in labor practices because of its industrial diversity, AIC says the typical company is paying for 2080 hours a year when only 1750 are worked on the average.

More liberal vacations, another paid holiday or two, more washup time are all cutting into the average workweek. The eighth paid holiday is getting more common.

That erosion of the average workweek has been going on for years, but it's worsening because of the shock of 1958's recession. "Spread-the-work drives—such as the reported USW demand for three normal 40 hour weeks followed by a 32 hour week—are getting closer to the ultimate union proposal: An across-the-board cut in hours worked each week," believes Mr. Vacha.

Noteworthy too are the appearance of more contract clauses providing that, before layoffs are made during times of poor business, the workweek will be cut from 40 to, say, 32 hours.

• While the workweek provisions of the contract are the broad avenue to security that unions follow, seniority clauses are the back-alley approach.

Managers must watch this kind of journey closely, or they won't recognize the union's destination until too late, warns Mr. Vacha. Unions generally want the widest possible seniority — plant-wide or company-wide. Managers generally want narrow seniority—departmental is usually best.

In layoffs and rehirings, unions want the decisions made on a strict seniority basis, with the employee's option to accept or reject the job recalled for. (A lathe hand doesn't want to be recalled for a sweeper's position.)

Managers should fight for a provision that allows layoffs and rehiring to be made on the basis of seniority, skill, and ability, believes Mr. Vacha. Equal weight should be given to all three. Many companies are also adding a fourth criterion—physical fitness. "The appraisal of a man's skill and ability should be left to management," he says, "but the judgment should be scrupulously fair."

"The 1958 shakeout proved that many a contract's seniority provisions were too loose," points out Mr. Vacha. They hadn't had the acid test in years. Some managers didn't even know exactly what they provided. They found out when they started to lay off. Managers today try to get seniority provisions that will permit them to lay off or recall on the basis of seniority but also by job classification, plus the skill, ability, and physical fitness criteria.

Superseniority also proved troublesome. Members of the union shop committee get laid off last. Mr. Vacha suggests adding this clause to the superseniority section: "Superseniority provided the man can perform the available work."

Here are other seniority problems to be on guard for:

Transfer from one department to another. The union wants the transferred employee to get the highest wage, either at the old or new job. Management should get a

contract clause which says it can pay at the lower rate if no work is available at the old job, believes Ray Vacha. Only if the transfer is at the company's convenience, should the higher rates go.

Job training. This one involves the training of an old employee for a new job in the company. Keep a long probation period on this one, says Mr. Vacha.

Job posting. "Avoid it if you can," he advises. This is the provision that requires a company to post the availability of vacant jobs so that old employees can try out for them if they want to. It can lead to a game of musical chairs. One man moves up, then a second moves to his vacant post, and so on. If you must have it, limit it to one or two moves.

Spot jobs. Unions are beginning to fight for contract clauses that eliminate or limit temporary help. Labor is aiming at the service organizations that provide temporary manpower for a flat fee.

• Labor's quest for security has led to its drive for Supplemental Unemployment Benefits. It aims to give security when workweek and seniority provisions are inadequate as safeguards.

One aspect of SUB that unions are worrying more about is that it forces managers to schedule hours and work more carefully to minimize the company's SUB liability. The result: Less security for some employees. "I haven't encountered any demand yet to counter that situation," says Ray Vacha, "but I'll bet the unions are trying to think of something."

SUB also is being tied in increasingly with severance pay pools. City Auto Stamping Co., Toledo, Ohio, was one of the first to grant it. Tool and die companies in Detroit also have it. (Severance pay demands of all sorts are another evidence of searching for security.)

Despite the publicity about SUB, only the minority in metalworking have it. Look for more demands concerning it, especially from smaller firms. (See next week's STEEL for more detail on SUB.)

• Besides workweek, seniority, and SUB contract provisions to assure security, unions may also try for restrictive clauses that hamper operating improvements.

Such featherbedding is typified by Section 2-B of the steel contract. It states that practices must remain in effect for the life of the contract. If a change in work methods enables a reduction in the crew size, the change can't be made. Or if work measurement people err in their studies, the error can't be rectified.

Some sources think 2-B is costing the steel industry as much as 7 or 8 cents an hour in excess personnel.

All too many metalworking contracts are even more restrictive than the steel example. They have provisions that prevent managers from taking full advantage of labor savings stemming from more productive equipment.

"The focus today is too much on the externals of job security and not enough on the factors that make for it," believes Mr. Vacha. "If more attention went to improving output per manhour, labor wouldn't have to spend so much time on the externals that are supposed to assure it. Then we'd really solve the quest for security."

Associated Industries of Cleveland's Ray Vacha tells what managers should watch for in unions' search for job security

• This is the first in a series of three articles on job security. The next two will appear July 20 and July 27. An extra copy of any or all in the series is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

W. European Steel Output, Trade Drop

WESTERN EUROPE'S steel output was down to 21.2 million tons in the first quarter, 2 million tons (8.6 per cent) below the figure for the corresponding period of 1958, reports the United Nations Economic Commission for Europe.

Output in European Coal & Steel Community nations in the first quarter was 1.2 million tons (8 per cent) below what it was in the same period last year. The decline was 14 per cent in West Germany, 7 per cent in Belgium and Italy, 5 per cent in France, and 2 per cent in the Saar. Production rose in the Netherlands and remained steady in Luxembourg.

Production in the United Kingdom exceeded 850,000 tons, 15 per cent below the year-ago mark.

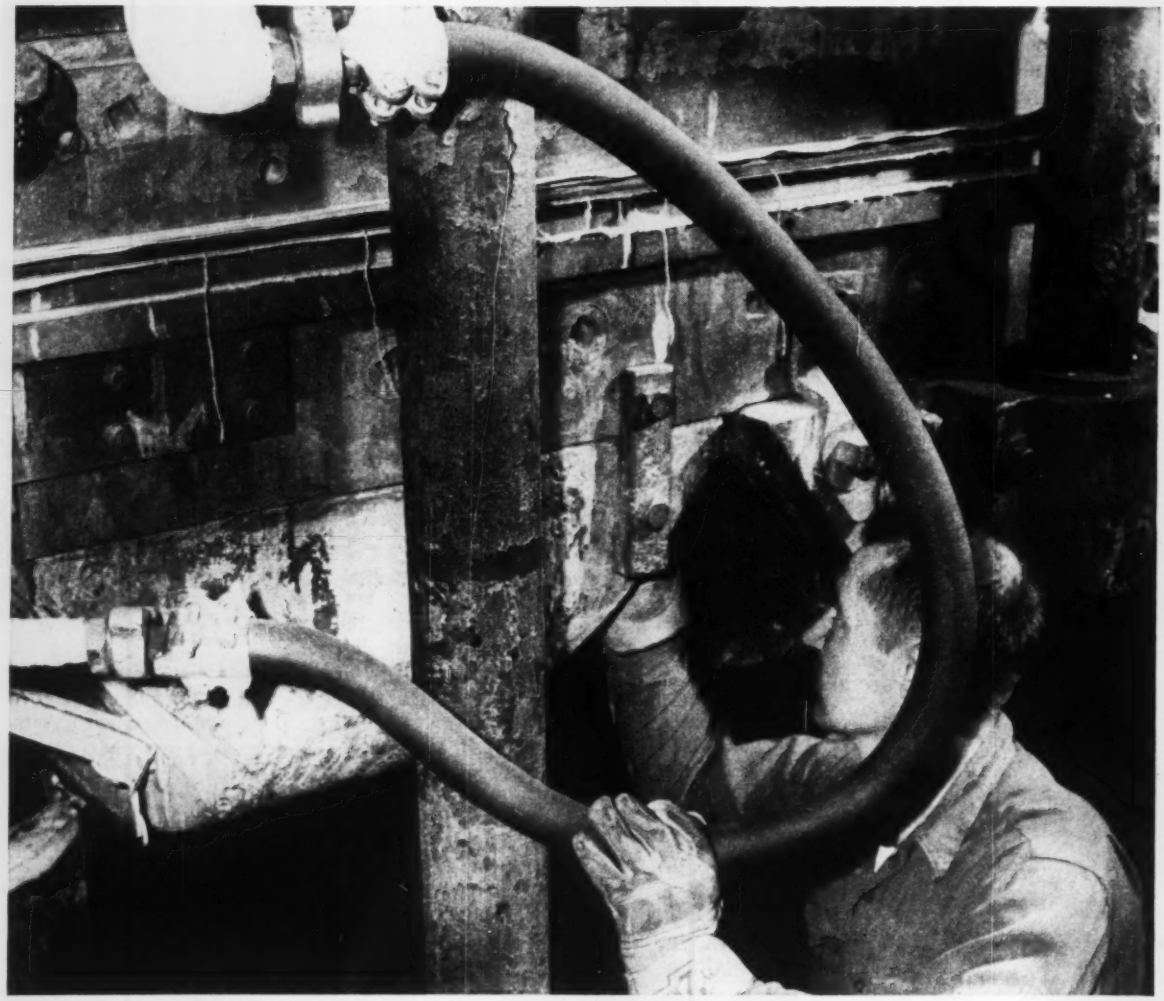
• Reds Up—Eastern Europe's steel output continued to increase. In th USSR, the gain was 1.2 million tons, or 9 per cent better than the figure for the first quarter of 1958. Production boosts during the same period came to 10 per cent in Poland and Czechoslovakia.

Output in the U. S. was also up. It topped 27.7 million tons of steel, over 10 million tons higher than in the same quarter last year.

• Imports Down—Import volume of finished steel products in Western Europe last year was 8 per cent under what it was in 1957. Imports were off 24 per cent in the Netherlands, 35 per cent in Switzerland, and 39 per cent in the United Kingdom. An opposite trend was observed in West Germany, Italy, and France. Imports to West Germany rose 14 per cent; to Italy, 13 per cent; and to France, 7 per cent.

• Exports Slide Slightly — Finished steel exports in 1958 were 1 per cent below what they were in 1957. The drop was 14 per cent in the United Kingdom, 12 per cent in Austria, and 5 per cent in West Germany. An upturn was recorded in the Netherlands (25 per cent), France, the Saar, and Italy (5 per cent each), and Belgium (2 per cent).

MATCHLESS STEAM HOSE



How to stay alive working next to live steam

Steam—indispensable workhorse in an industrial plant. But if it breaks loose, steam may cause death on contact. Yet this man works with complete security—literally within an inch of his life—because he's working next to the hose that steam cannot burst: wire-braided U.S. Matchless® Steam.

This hose gives ample notice when replacement is needed. Even after long, hard service (and with 200 pound steam pressure) the safety-sure wire-braid construction of U.S. Matchless prevents it from bursting. Instead, just a wisp of steam is allowed to seep through. This acts as a safety device, telling you that replacement is needed. That's why plant safety councils all over the country find no match for U. S. Matchless.

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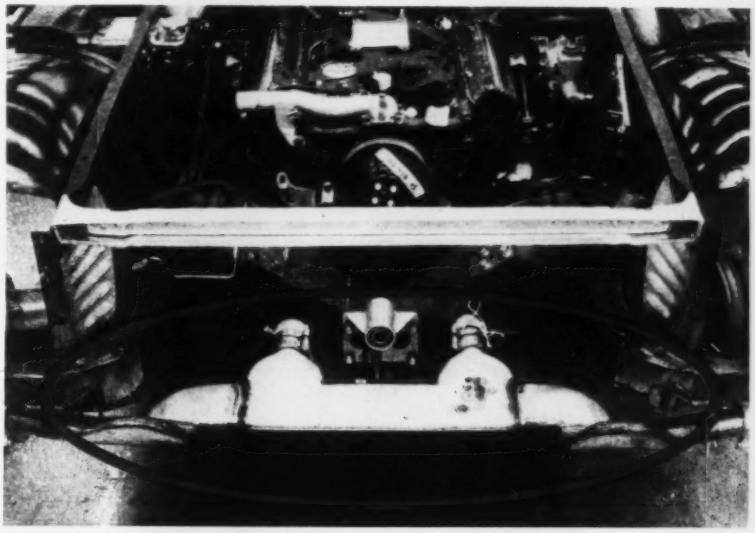
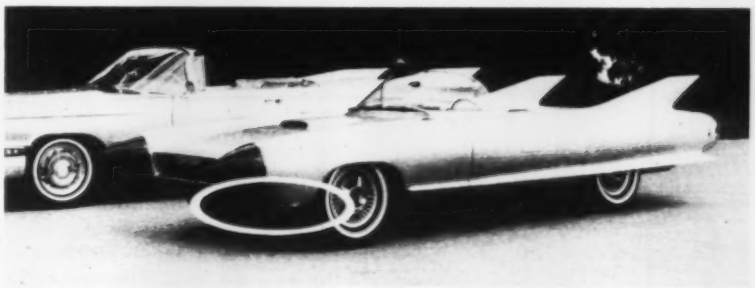
Can Auto Mufflers Be Up Front?

LEGAL RATHER THAN mechanical restrictions apparently are the prime reasons why mufflers haven't been moved up behind the front bumper or into the engine compartment. Auto engineers say they can design mufflers that will work satisfactorily in this location. There's talk that Ford and General Motors are less than three years away from introducing such devices. The advantages: Simplified, cheaper exhaust systems, lower floor pans for more passenger compartment room.

Mufflers originally were developed as sound baffles to silence the noise of engine operation. Exhaust pipes were added to prevent carbon monoxide from getting into the passenger compartment. In the early 1900s many of the pipes were aimed downward, and the exhausts stirred up huge dust clouds on unpaved roads. In an effort to keep down dust, many states passed laws saying that exhaust pipes must extend beyond the rear axle and must spew fumes straight out behind the car.



Cadillac's experimental Cyclone has the muffler up front . . .



But its exhaust pipe location is illegal in some states

• **Hodgepodge Develops**—As tailpipes got longer and engine compressions were increased, more problems beset muffler manufacturers. The pipes themselves set up sympathetic sound vibrations, making for exhaust rumble. Mufflers had to be enlarged to help dampen these vibrations. Resonators were added. Higher compressions created more exhaust gases and mufflers had to be enlarged again to keep down backpressures. Complicated body frames meant mufflers had to be broken into smaller units so more resonators were added to make the whole works fit underneath the car. Finally, the V-8 engine brought about adoption of dual exhaust systems that added more mystery to the maze of piping. At the same time, new additives in high octane gasolines created highly corrosive exhaust liquids that cut muffler life from 30 to 18 months.

As one acoustical engineer wryly puts it: "First we developed mufflers to dampen engine noise. Then we added tailpipes to keep from killing off the drivers with carbon monoxide. Then we had to put on resonators to dampen the rumble developed by the tailpipes. Then engine compressions went up, and we doubled everything in sight. Now we've got such a gobbledegook of baffles, resonators, and pipes spreading all over the bottom of the car, we've almost forgotten what the muffler is really supposed to do!"

That isn't strictly true, but it's close enough to make a front mounted muffler seem like a pleasant dream to Detroit designers. Muffler-makers may have other ideas.

• **How to Cure It**—Aluminized and galvanized steels are inexpensive and workable enough to extend muffler life up to 22 months, shows one survey. Stainless steel mufflers give even better protection, but R. A. Heath, chief engineer, Michigan Div., Walker Mfg. Co., Racine, Wis., sums up its limitations: "We believe stainless steel would be good for mufflers, but in addition to being hard to form and weld, its price is high." Ceramic coatings show promise, but cost and manufactur-

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ing problems still make them prohibitive except for specialized uses.

Front mounted mufflers can be designed for present materials and give quiet operation and long life without building up temperatures that are dangerous to other components in the engine compartment. With shorter tailpipes there's less need for resonators and piping. The industry is developing catalytic afterburners to control unburned hydrocarbons that have stirred up a furor in smogbound California. They could be more easily mounted up front than underneath the car, says a GM technician.

Legal restrictions in California, Connecticut, and the District of Columbia are the prime stumbling blocks against putting mufflers up front. Dust is no factor.

• **AMA Cites Tests** — The Automobile Manufacturers Association has developed test procedures to show the relationships of exhaust locations and passenger safety. After testing different cars with different exhaust locations, the AMA indicates that it makes no difference where exhausts are located.

Concludes the AMA: "A re-examination of regulatory practices is suggested." By the time California, Connecticut, and the District of Columbia agree, the industry should be ready to move mufflers up front.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	558,015	337,446
6 Mo. Totals	3,283,983	2,242,348
July		321,017
August		180,447
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
June 6	125,186	73,696
June 13	127,029	78,163
June 20	129,270	84,396
June 27	127,217	92,277
July 4	108,329†	35,273
July 11	122,000*	73,062

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Chevy Consultant Tells Light Car Design

General Motors' Chevrolet Div. has asked Maurice Olley, former director of research and development—now an independent consultant—to discuss design considerations of a rear engine light car. Although no names are mentioned, Chevrolet's forthcoming Corvair is the only light car that fits Mr. Olley's description

WEIGHT DISTRIBUTION is the first consideration in designing a new car from scratch, says Mr. Olley. It must be comfortable to ride and steer. It must be safe to stop no matter how heavily or lightly it's loaded. A good balance is to place 40 per cent of the car's weight and load in the rear; 60 per cent in front.

"By building an air cooled engine just back of the rear wheels, with an integral aluminum transmission just ahead of it, it is possible to concentrate all the driving mechanism in the rear of the car and, with a light integral body, still come out with a 40 to 60 weight distribution," he declares.

• **Handling**—When tires and suspensions are correctly adapted to their loads, a car with this 40:60 balance will handle the same way, regardless of payload. Mr. Olley points out the two requirements for stable handling in a rear engine vehicle: Rear tires must not be overloaded; and there should be a slight amount of understeer in the rear wheels so they'll give a slightly better sense of direction.

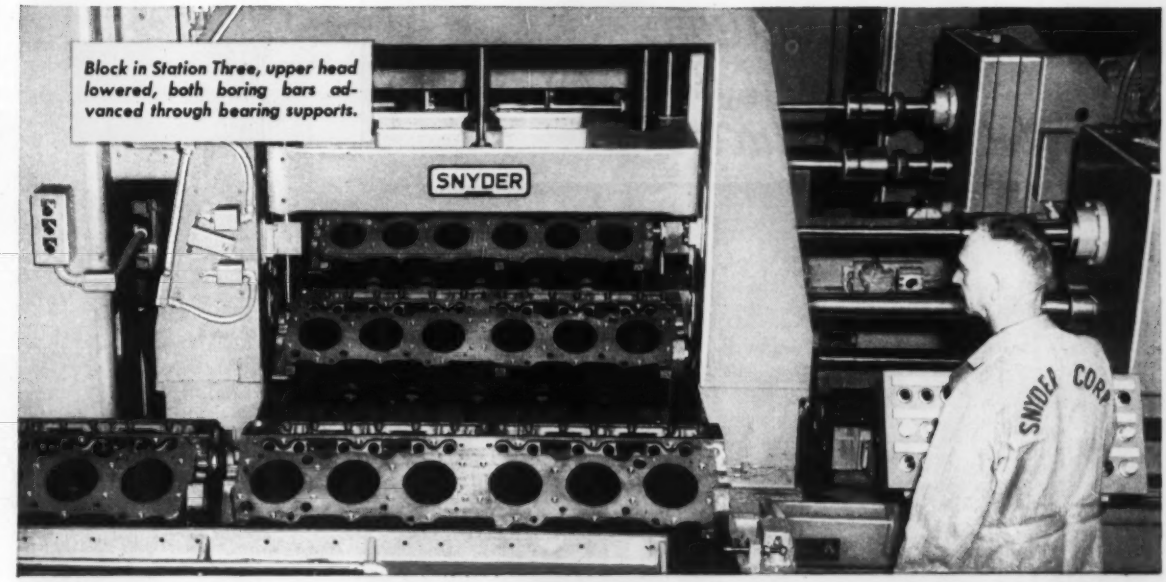
That can be done by using low profile, long cord tires on wide rims. There's no need to use oversize tires on the rear, or to use different tire sizes on front and rear wheels. "With proper tire inflation, and with the assistance of independent suspension in front and a swing axle at the rear, we have produced the desired margin of understeer. This car design will maintain its weight balance and riding, handling, and braking characteristics at all loads," asserts Mr. Olley.

• **Body Construction**—"We have a much improved body, excellently adapted for integral construction since it is not weakened structurally by a central tunnel or by being split in front to mount an engine. It can combine a low roof with ample headroom, adequate seat height, and a flat floor," Mr. Olley explains. Stronger front structure and large front tires with low inflation make for quiet operation because there's little road noise and no engine noise or shake from the front compartment. The lightly loaded front tires make for easy steering.

Mr. Olley points out that this type car can use a flat, aluminum engine (six cylinders, air cooled) which normally would be too wide to fit between the front wheels, but is ideal for rear mounting. It's half the weight of present V-8s and forms a compact unit with the transmission and drive gears. High gear drive is direct.

• **Other Savings**—This type engine needs no water pump, radiator, or water connections. Mr. Olley says the engine is up to temperature 2 minutes after starting. This saves fuel normally needed to heat up the cast iron blocks of conventional engines. The engine is fan cooled instead of using forced air. All parts are completely visible and easily accessible. The gas tank is behind the front suspension system and within the body structure so it's completely removed from the exhaust system and protected from collision damage. Its location means less fuel loss due to evaporation in hot weather.

Brake life is extended because front and rear brakes do an equal amount of work on a rear engine car. Mr. Olley claims that the conventional type of light car, carrying only a driver, often is so close to unloading the rear end that little useful braking can be done with the rear wheels. "The rear engine car remains almost level when braking, and there's no overloading of front tires when brakes are applied hard," he adds.



Block in Station Three, upper head lowered, both boring bars advanced through bearing supports.

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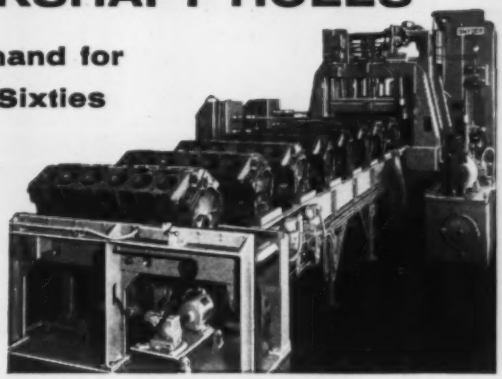

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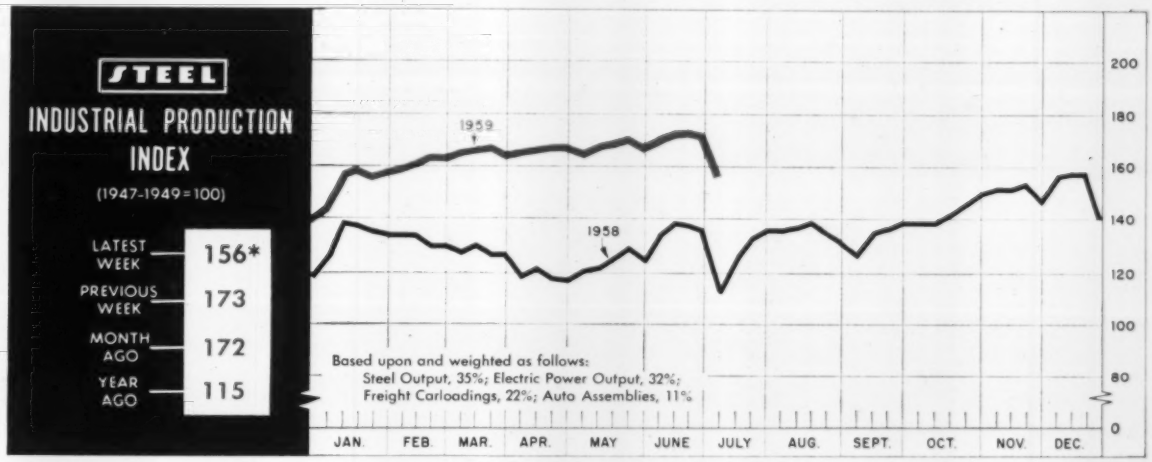

*Week ended July 4.

Get Set for Fourth Quarter Push

BUSINESSMEN have done an about-face regarding the business picture in the last few months. Now instead of worrying about keeping up a head of steam, they are wondering whether they can keep the pressure from getting out of control and causing another blowoff in the next year or two.

The word "boom" is being used more and more to describe the business outlook (see Page 56), and with justification. After all, we have passed prerecession highs in many major areas by significant margins.

• **GNP Tops Estimates**—Gross national product, the omnibus indicator of the nation's output of goods and services, is already crowding the $475 billion annual rate, which is only slightly below the level freely predicted earlier for the fourth quarter. That has been accomplished with somewhat less than the full support of the capital goods sector of the economy. Now that this potent force is throwing in its weight, it's anybody's guess as to how high the economy can climb.

But that's only half the story. Economists figured that other parts of the economy which gave it the initial upward thrust in the recovery would be played out or at least leveled off by midyear. That hasn't happened, and now they are revising upward earlier estimates '59.

• **Aluminum Forecast Revised**—Typical of that change in outlook are statements from the Business & Defense Services Administration concerning three basic metalworking industries. Last December, BDSA predicted aluminum consumption in 1959 would top the 1958 figure by about 20 per cent. But demand has increased so rapidly in the first half that now the agency figures the gain will be between 25 and 30 per cent. That would surpass the previous peak (1956) by 10 to 12 per cent.

Part of the first half gains must

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,336[1]	2,215	1,442
Electric Power Distributed (million kw-hr)	13,100[1]	13,749	11,500
Bituminous Coal Output (1,000 tons)	8,595[1]	9,255	8,887
Crude Oil Production (daily avg—1,000 bbl)	6,950[1]	7,025	6,427
Construction Volume (*ENR*—millions)	$474.1	$491.9	$466.3
Auto, Truck Output, U. S., Canada (*Ward's*)	139,936[1]	164,608	46,206
TRADE			
Freight Carloadings (1,000 Cars)	550[1]	698	458
Business Failures (Dun & Bradstreet)	256	267	335
Currency in Circulation (millions)[3]	$31,858	$31,814	$31,163
Dept. Store Sales (changes from year ago)[3]	+7%	+22%	−4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$25,893	$25,868	$26,110
Federal Gross Debt (billions)	$284.4	$284.6	$276.3
Bond Volume, NYSE (millions)	$23.4	$26.4	$19.2
Stocks Sales, NYSE (thousands of shares)	12,957	14,772	10,427
Loans and Investments (billions)[4]	$94.5	$95.2	$95.8
U. S. Govt. Obligations Held (billions)[4]	$27.5	$28.1	$32.6
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	221.4	221.8	196.0
All Commodities[7]	119.6[1]	119.6	119.2
Commodities Other than Farm & Foods[7]	127.9[1]	127.9	125.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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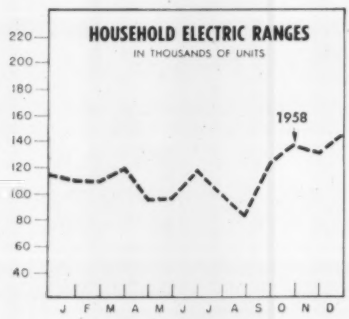
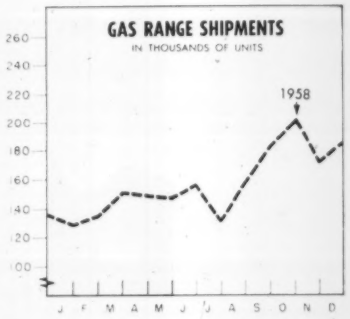
THE BUSINESS TREND





Total Factory Sales—Units

	1959	1958	1957
Jan.	120,800	109,000	144,500
Feb.	134,600	108 700	127,700
Mar.	172 600	117,900	139,400
Apr.	136,100	95,600	107,200
May	133,400	96,000	93,600
June	.....	116,800	102,300
July	.....	98,500	88,700
Aug.	.....	81,400	85,800
Sept.	.....	121,800	124,800
Oct.	.....	135,500	120,400
Nov.	.....	129 000	116,800
Dec.	.....	143,900	113,800
Totals	.....	1,354,100	1,365,000

National Electrical Mfrs. Assn.
Charts copyright, 1959, STEEL.

Shipments—Units

	1959	1958	1957
Jan.	148,800	128,200	149,600
Feb.	152,400	134,200	161,600
Mar.	171,500	149,300	179,400
Apr.	164,800	148,300	168,800
May	157,900*	147,300	156,200
June	.....	155 800	155,300
July	.....	129 300	137,400
Aug.	.....	157,600	182,600
Sept.	.....	182,100	192,100
Oct.	.....	211,900	195,500
Nov.	.....	171,100	154,300
Dec.	.....	181,000	135,800
Totals	.....	1,896,100	1,968,600

*Preliminary.
Gas Appliance Mfrs. Assn.

be attributed to forward buying at the guaranteed price (which expired on June 30) and hedging against a possible industry strike. But BDSA cites genuine gains in the following industries for the upward revision: Automotive, construction and home building, household appliances, containers, and steelmaking. Primary output should reach 1,950,000 tons this year, or 16 per cent higher than in record 1956.

• **Canmakers Gain**—The output of metal cans, which lagged the year-ago total for the first quarter, made up for the difference in April. BDSA sees continued gains throughout the year, pushing 1959 within 0.5 per cent of the record set in 1956. The increase over 1958's figure will be 2 to 5 per cent. Consumption of steel in the first quarter was 958,-484 tons, higher than in any other similar period except in 1958, when abnormally heavy shipments swelled the total.

• **Nickel Use Up**—The high rate of shipments of primary nickel in the first five months of this year has prompted BDSA officials to revise upward their estimate of Feb. 11. They now see consumption of 230 million to 240 million lb. That would still be under the 1956 and 1957 figures, but it would be about 50 per cent better than in 1958.

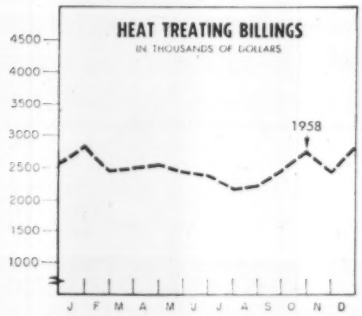
Credit Chief Optimistic

Adding his voice to the swelling chorus is Edwin B. Moran, executive vice president, National Association of Credit Management. "Steel strike or not, expectations for added business gains in the third quarter are more and more pronounced, and optimism for the fourth quarter is even more positive," he declares.

He notes 11 reasons for his optimism: 1. Higher corporate earnings. 2. Shrinking unemployment. 3. All-time high production. 4. Increased car and truck output. 5. Rising capital spending. 6. Better department store buying. 7. Greater research and development expenditures. 8. Booming construction. 9. Improved construction machinery production. 10. Record chemical industry output. 11. All-time high in resort and vacation travel.

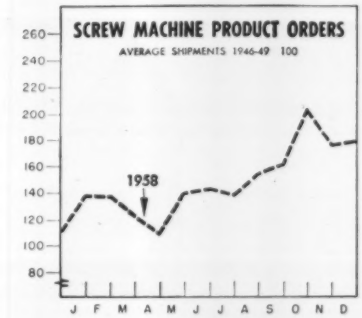
Index Takes a Holiday

For the second consecutive month, shipments of durable goods industries set a record when they



	1959	1958	1957
Jan.	2,915.5	2,825.5	3,533.9
Feb.	2,976.0	2,466.3	3,378.9
Mar.	3,397.3	2,490.5	3,631.8
Apr.	3,420.6	2,538.0	3,572.4
May	3,405.6	2,421.5	3,389.6
June	.....	2,374.8	2,912.1
July	.....	2,139.6	2,767.5
Aug.	.....	2,213.0	2,830.8
Sept.	.....	2,457.1	2,765 0
Oct.	.....	2,744.9	3,076.2
Nov.	.....	2,422.0	2,677.2
Dec.	.....	2,799.4	2,579.3

Metal Treating Institute.



	New Orders 1959	New Orders 1958	Shipments 1959	Shipments 1958
Jan.	215	138	193	165
Feb.	236	137	193	145
Mar.	260	122	214	141
Apr.	234	108	217	141
May	205*	139	200	134
June	...	142	...	133
July	...	138	...	124
Aug.	...	154	...	142
Sept.	...	161	...	151
Oct.	...	203	...	184
Nov.	...	176	...	158
Dec.	...	179	...	175
Avg	...	150	...	149

*Preliminary.
National Screw Machine Products Assn.

chalked up $15.4 billion in May, reports the Office of Business Economics. That exceeded April's shipments by $200 million. At the same time, inventories reached $29.7 billion, or $300 million better than in April. Both of those increases were largely a reflection of the increased activity in the steel industry.

On the other hand, new orders for durables dropped from the April record of $15.8 billion to $15.1 billion as orders for steel eased prior to the original contract deadline. That is the lowest level since February.

Sales Rise, Orders Fall

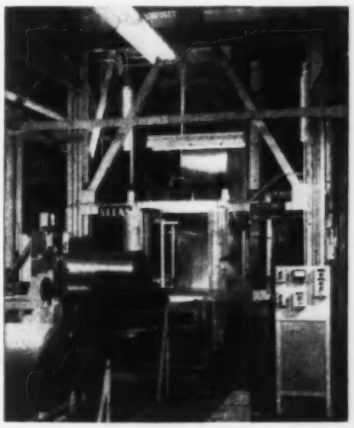
STEEL's industrial production index, which held at record or near-record levels right up to the original steel industry contract deadline, finally came off the lofty perch and plunged 17 points to a preliminary 156 (1947-49 = 100). Reasons: 1. The July 4 holiday. 2. The coal miners' holiday and the seamen's strike on the Great Lakes, which chopped off a significant portion of the railroad industry's freight carloadings. 3. Wildcat strikes in the steel industry, which took output during the week ended July 3 to the lowest point since the last week in January.

It isn't likely that the index will come all the way back until sometime in the third quarter. Carloadings will remain depressed until the coal miners return. Steel output will be off for some time even if a settlement or extension is agreed upon by tomorrow night (July 14). Auto production is declining little by little as makers begin to change over to 1960 models. Chrysler Corp.'s Imperial Div. shut down on July 1, and the rest of the company's divisions are expected to start changeover operations this week. Only electric power will remain strong, following its seasonal pattern.

Appliances Coming Back

Appliance makers are in the midst of their normal seasonal decline (see charts, Page 74), but an indication of things to come is the announcement by Maytag Co. that it will add about 165 persons to its payroll after annual vacation is over on July 20. The company will double its production of gas and electric clothes dryers in response to "anticipated seasonal upturn in demand."

To meet demands for perfect finish on stainless and nickel Thinstrip®, Somers installs unique new annealing furnace.



This new Selas vertical continuous annealing furnace assures uncontaminated, commercially unmarred surfaces as well as uniform temper and faster delivery on stainless, nickel and nickel alloy Thinstrip up to 25" wide. But this is only part of the story of Somers' quality. Sendzimir rolling mills, Accu-Ray gauging plus 50 years leadership in thin gauge metals (from .010 down to .000125") are a few of the features Somers offers to assist you with your Thinstrip® problems.

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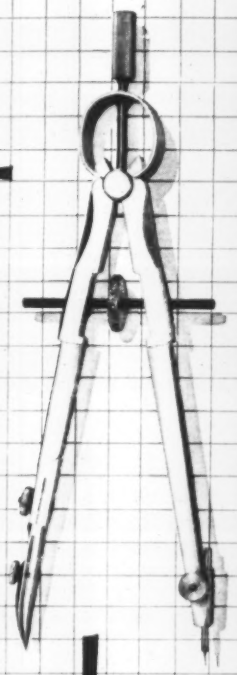

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Circo Equipment president

JOHN C. MONDAY
Hapco general manager

DANIEL S. STEELMAN
Fischer & Porter purchasing

KIMBALL C. CUMMINGS
Minneapolis-Honeywell post

Wellington Vandeveer was elected president, **Circo Equipment Co.**, Clark, N. J., succeeding **Melville Morris**, resigned. Mr. Vandeveer was sales planning manager for Merck & Co. **Severn Carlson** was named to direct sales for both Circo Equipment and the newly formed subsidiary, Circo Ultrasonic Corp. **Benson Carlin** was appointed executive vice president of the subsidiary. He was formerly head of Alcar Instruments Inc.

John C. Monday was appointed general manager, **Hubbard Aluminum Products Div.**, Hubbard & Co. He has headquarters in Pittsburgh. He was manager, Regulator Div., Hevi-Duty Electrical Co.

International Business Machines Corp. appointed **Martin C. Stutzbach** purchasing agent for research laboratories in Westchester and Poughkeepie, N. Y. He has headquarters at the Mohansic Laboratory, Yorktown Heights, N. Y. **Louis A. Howard** was made procurement manager for the Oswego, N. Y., facility.

W. J. Wenger was named vice president-roll sales, **Blaw-Knox Co.**, Pittsburgh. He succeeds **A. E. Murton**, recently made vice president in charge of the new Foundry & Mill Machinery Group. **Richard F. Ringham** succeeds Mr. Wenger as assistant manager-roll sales.

Henry C. Nelson was appointed superintendent of **General Electric Co.'s** Anaheim, Calif., plant. He retains the post of manager of engineering there.

Daniel S. Steelman was appointed director of purchasing, **Fischer & Porter Co.**, Hatboro, Pa. He was purchasing agent. Mr. Steelman also directs purchasing for F&P subsidiaries.

Charles F. Lloyd Jr. was made general sales manager; **Adam T. Engel Jr.**, assistant secretary, **Fort Duquesne Steel Co.**, Pittsburgh.

S. J. Becker was appointed vice president and chief engineer, Spring Div., Bellwood, Ill., **Borg-Warner Corp.**

Harry B. Dauphinais was appointed assistant to **Lewis D. Fykse**, corporate director of marketing at **Associated Spring Corp.**, Bristol, Conn. **Stanley M. Rimmer** succeeds Mr. Dauphinais as general manager, Gibson Div., Chicago. **John B. Beckwith** succeeds Mr. Rimmer as spring works manager, Bristol divisions.

Theodore A. Short was made sales promotion manager for original equipment by **Dresser Mfg. Div.**, Bradford, Pa., Dresser Industries Inc. He was with Goodyear Tire & Rubber Co.

George H. Malony succeeds **E. S. Anderson**, retired, as assistant sales manager, **Whitman & Barnes Div.**, Plymouth, Mich., United-Greenfield Corp.

C. E. Newcomb was named manager-research facilities planning, **Crucible Steel Co. of America**, Pittsburgh. He was assistant manager-engineering at the Midland, Pa., Research Laboratory.

Kimball C. Cummings was made manager of engineering, Beltsville, Md., Div., **Minneapolis-Honeywell Regulator Co.** He was associate director of research of the company's Aeronautical Div. He is now in charge of design and development of magnetic tape systems and components for instrumentation and data-handling fields.

Ernest E. Harkess was made manager of **Ford Motor Co.'s** Cleveland foundry in Brook Park. He replaces **E. Claude Jeter**, promoted to manufacturing manager of foundries in the company's Engine & Foundry Div., in charge of the Cleveland foundry, Dearborn, Mich., foundries, and the Sheffield, Ala., foundry.

Robert A. Wieland was appointed assistant plant manager, Marion Forge Div., Marion, Ohio, **Eaton Mfg. Co.** He was chief industrial engineer, Axle Div., Cleveland.

John D. Lewis was made sales manager, Steel & Tubes Div., Burlington, N. J., **United States Pipe & Foundry Co.**

William C. H. Ramage was elected president and chief executive officer of **Valley Mould & Iron Corp.**, Hubbard, Ohio. Former vice president, he succeeds his father, **W. Haig Ramage**, named chairman. **C. E. Swab**, vice president, was elected vice chairman. **Floyd D. Hunter**, secretary-treasurer, was also named vice president.

W. D. LaRue, district manager of **Crane Co.'s** Mountain States area, was promoted to general manager of

CHARLES A. DeVRIES
Fosdick Machine and R. K. LeBlond purchasing

VINCENT W. STEHLIN

WILLIAM M. MYLER JR.

JOSEPH F. HILL
engineering managers of Janitrol divisions

wholesale sales, with headquarters in Chicago.

Charles A. DeVries was made purchasing agent and assistant to the president, **Fosdick Machine Tool Co.**, Cincinnati. He was a plant engineer. He succeeds **Vincent W. Stehlin**, promoted to assistant purchasing agent with the parent company, **R. K. LeBlond Machine Tool Co.**, Cincinnati.

Howard M. Sullivan was made manager of merchandising, **Clayton Mark & Co.**, Evanston, Ill.

Yale & Towne Mfg. Co. established new corporate planning departments at New York. Named to the new post of director of executive development is **James H. Eddy**; and to the new post of director of planning, **Frank P. Minnelli**. Mr. Eddy was director of personnel administration, systems, and procedures for the Lock & Hardware Div., White Plains, N. Y. Mr. Minnelli was marketing manager, Material Handling Div., Philadelphia.

William M. Myler Jr. and **Joseph F. Hill** were appointed managers of engineering, **Janitrol Divisions**, Surface Combustion Corp., Columbus, Ohio. Mr. Myler will manage the section which designs and engineers Janitrol gas and oil fired residence, commercial, and industrial space heating and cooling equipment. Mr. Hill will manage the Janitrol aircraft and missile components, and aircraft and missile ground support equipment.

Donald F. Henry was made manager-market research, **Anaconda Aluminum Co.**, Louisville.

Charles D. Smith, works manager at the Trentwood, Wash., rolling mill, **Kaiser Aluminum & Chemical Corp.**, was appointed manager of the Ravenswood, W. Va., Works. He succeeds **Lloyd A. Amos**, transferred to Kaiser Aluminum headquarters at Oakland, Calif., to accept increased responsibilities in a new executive assignment. **Robert F. Buechner**, former plant manager of the reduction facilities at Ravenswood, was named works manager at Trentwood.

Charles E. Shinn was named director of research and development in Hartford, Conn., for **Royal McBee Corp.**

William P. Ziegler Jr. was made national sales manager of **Kolene Corp.**, Detroit.

Edward H. Lloyd Jr. was made manager of **Alan Wood Steel Co.'s** new Boston district sales office, at 824 Boylston St., Chestnut Hill, Mass.

Nippon Kokan K. K. (Japan Steel & Tube Corp.) appointed **Kaichi Hikami** to succeed **Kenzo Fujiwara** as general manager, New York office.

Dr. Bernard Kopelman was appointed technical director for **Beryllium Corp.**, Reading, Pa. He was manager-electroluminescent engineering, Sylvania Electric Products Corp., and had formerly served its subsidiary, Sylvania-Corning Nuclear

JAMES H. EDDY
Yale & Towne exec. div.

FRANK P. MINNELLI
Yale & Towne dir.-planning

CHARLES D. SMITH
Kaiser Aluminum works mgr.

DR. BERNARD KOPELMAN
Berylco technical dir.

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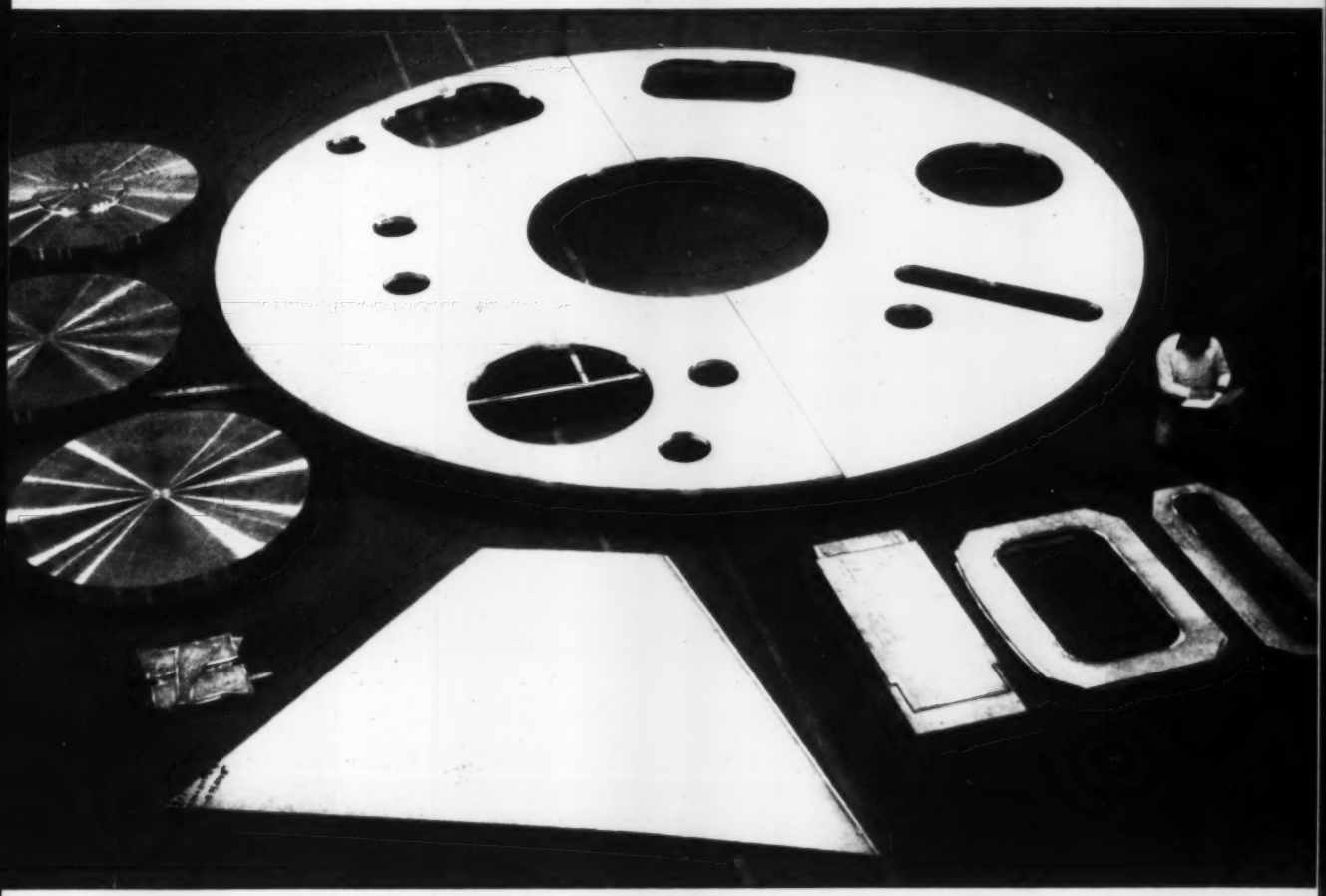

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GE-lamp metals marketing

HOWARD B. LEWIS
Consolidated Electro. post

MAJ. GEN. MARSHALL S. ROTH
Richards-Wilcox v. p.

HOWARD E. ROBINSON
J&L production planning

J. HUBERT THOMPSON
Gadsden bar mill supt.

E. F. ANDREWS
Allegheny Ludlum purchasing

Corp., as director of market development.

Howard E. Robinson fills the new post of director of production planning programs for **Jones & Laughlin Steel Corp.**, Pittsburgh. He was general manager-product divisions, and is succeeded by **William L. Cressman.**

J. Hubert Thompson was appointed superintendent of the bar mill at the Gadsden, Ala., plant of **Republic Steel Corp.** He succeeds **Paul Moffett,** retired. Mr. Thompson was assistant superintendent.

Elis S. Hoglund was made general manager of **General Motors Overseas Operations Div.,** General Motors Corp. He succeeds **Edward Riley,** retired. In GM's Research Laboratories, **Maurice D. Cooper** was made head of the Chemistry Dept.; **Dr. Philip Weiss,** head of the Polymers Dept.

Frank Zeitlin was named assistant vice president, **Mallinckrodt Nuclear Corp.,** St. Louis, subsidiary of Mallinckrodt Chemical Works.

E. F. Andrews was named director of purchases, **Allegheny Ludlum Steel Corp.,** Pittsburgh, a new post. **L. H. Bittner** remains as vice president-purchases. Two new purchasing departments are headed by **N. W. Hayson** as manager-Maintenance, Repair, and Operating Supplies Dept.; and **A. B. Wadsworth Jr.** as manager-Raw Materials, Equipment, and Construction Dept. **R. G. Hemphill** and **W. R. Solomon** were named senior buyers.

William B. Sawers was made manager, Coupling Dept., Metal Products Div., Baltimore, **Koppers Co. Inc.** He was assistant manager, Piston Ring & Seal Dept.

Robert O. Bradley was named chief engineer, **Haughton Elevator Div.,** Toledo Scale Corp., Toledo, Ohio. **Robert E. Bell** was named chief engineer, **Toledo Scale Div.**

E. G. Gebhardt was made sales manager, **William Bayley Co.,** Springfield, Ohio, succeeding **C. H. Thompson,** retired.

Adam MacKenzie was made marketing manager, Lamp Metals & Components Dept., Cleveland, **General Electric Co.** He was manager of the department's Cleveland welds plant. Mr. MacKenzie succeeds **J. W. Forbes.**

Howard B. Lewis was made chief engineer, Transducer Div., Monrovia, Calif., **Consolidated Electrodynamics Corp.** Managers for newly established engineering groups are: **James H. Gradin,** ceramic products; **Robert R. Mawson,** potentiometer products; **Robert E. Stanaway,** strain gage products. Managers for two other new groups: (galvanometers, plexicoders, and electrokinetic products; and vibrometers, pressure standards and accelerometers) will be named later.

Maj. Gen. Marshall S. Roth, former chief of staff, Air Defense Command, was elected vice president of **Richards-Wilcox Mfg. Co.,** Aurora, Ill. He joined R-W in 1957 as assistant to the president.

Wayne A. Pakkala, former general superintendent, Minnesota mines, **Cleveland-Cliffs Iron Co.,** transferred to the executive office in Cleveland as technical assistant in the Mining Dept.

O. M. Haseltine was made sales manager, **Ajax Electric Co.,** Philadelphia.

OBITUARIES...

Production and sales officials of **Continental Can Co.,** New York, killed in a company plane crash July 1 at Marion, Ohio, were: **Jacob Derliek, J. M. Kelly, W. J. Mutschler, M. D. Sandine, H. G. Schier, A. W. Sherwood Jr., J. R. Wallace,** and **R. I. Weimerskirch.** They were returning from Chicago after attending a meeting at the firm's Metal Research & Development Center.

Vincent Cada, 72, former director of purchases for **Eaton Mfg. Co.,** Cleveland, died July 1 in Pompano Beach, Fla.

Ronald T. Riley, 50, president, **Canadian Pratt & Whitney Aircraft Co. Ltd.,** Montreal, Que., subsidiary of United Aircraft Corp., died June 24.

STEEL MILL CUTS REGRINDING TIME IN HALF WITH MIDVAC

Micro Lustre

VACUUM MELTED FINISHING ROLLS

A switch from air-melted rolls to MidVac Rolls reduced regrinding and refinishing time by as much as 50% in one large steel mill. Now, operators can refinish rolls quicker to a higher polish which produces finer sheets.

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Granite City Steel Launches Another Expansion Program

RAPID GROWTH of Granite City Steel Co. is making the St. Louis metropolitan area an increasingly attractive location for steel fabricating plants. The firm's average annual capacity is gaining at a rate of about 14 per cent compared with an industry average of 4 per cent a year for 1947-56, the last period of sustained growth in the national economy, says N. P. Veeder, chairman and president.

Granite City has launched an expansion program to raise its annual steelmaking capacity by 10 per cent to a total of 1,740,000 tons. Major construction will be completed by the end of 1961. The program interlocks with another one begun in 1956 and scheduled to be completed by the end of this year (STEEL, May 25, p. 173). It will lift present rated capacity of 1,440,000 tons a year to 1,584,000 tons by Dec. 31.

• **Expansion Details**—The new program will include:

1. Replacement of one of the company's two blast furnaces with a new furnace having a 28 ft hearth diameter and a rated capacity of 1800 tons of pig iron a day, double that of the replaced furnace. Daily pig iron capacity of the firm will be 3000 tons.

2. Structural and design changes and more use of oxygen in its seven open hearth furnaces. The conventional silica brick roofs are being replaced with advanced forms of basic brick to withstand the higher operating temperatures that result from the use of oxygen. Three furnaces have been equipped with water-cooled roof lances; the other furnaces will get the same equipment.

3. Further improvements in the cold rolling department.

4. Installation of a second continuous galvanizing line and a second electrolytic tin plate line to apply coating to continuous lengths of sheet steel in strip form. Construction of the 277 ft long tin plate line has started. Production capacity will be 12,000 tons of tin plate a month. At present, the company operates four hot-dip pot lines and one continuous line, the output of which was increased early this year by improvements to some sections of the 348 ft long unit.

Norton Buys G & E Lines

Norton Co., Worcester, Mass., has acquired the lines of Gould & Eberhardt Inc., Irvington, N. J. Norton management reports that the G & E shapers and gear cutting machine will be built in the Norton machine division plant in Worcester.

Enters Wire Product Field

Southwest Wire Products Corp., Dallas, has been organized to manufacture concrete reinforcement wire. The plant was placed in operation last month and has a rated capacity of 1000 tons a month. Officers include: Chairman, Kurt Orban; president, Arthur Nichols; treasurer, Hugo Rothschild; secretary, A. A. Patterson; and vice presidents, Joe Reagan and Gil Coughlin.

Plans Two Canadian Plants

Matthiessen & Hegeler Zinc Co., La Salle, Ill., will build a zinc sulfide roasting plant and sulfuric acid plant at Port Maitland, Ont. The roasting plant will utilize the fluid bed principle and will be operated under license from the New Jersey Zinc Co., New York. Output of the sulfuric acid plant will be sold to the Electric Reduction Co. of Canada Ltd. and its subsidiaries. Electric Reduction is constructing a chemical plant at Port Maitland for the manufacture of phosphoric acid, superphosphate, and other phosphate chemicals.

The announcement was made through Sherbrooke Metallurgical Co. Ltd., La Salle, whose officers include: H. D. Carus, president; C. R. MacBrayne, vice president; and R. J. Bennett, secretary-treasurer. Mr. Bennett will be plant manager of Matthiessen & Hegeler's new undertaking. The plant is expected to start operations on July 1, 1960.

Prospects for Iron Ore

Sheffield Div., Armco Steel Co., Kansas City, Mo., is core drilling for iron ore on a several thousand acre tract it has optioned near Napoleon, Mo. Further steps must await results of this exploration. Work is progressing on the $35 million Pea Ridge project of Meramec Mining Co. (owned by Bethlehem Steel Co. and St. Joseph Lead Co.) (STEEL, Nov. 17, 1958, p. 60). The Missouri Division of Resources and Development reports its iron content is about 63 per cent.

CF&I Plans Expansion

Colorado Fuel & Iron Corp., Denver, is raising $40 million on first mortgage bonds, including $21 million for plant expansion and modernization. While most of the expansion money will go to the Pueblo, Colo., plant, part of it will be used for new equipment at the Wickwire Spencer Steel Div., Buffalo Plant, Tonawanda, N. Y.

Smith May Build Abroad

A. O. Smith Corp., Milwaukee, plans to extend its manufacturing activities to foreign countries. It is negotiating with a number of companies for joint manufacturing ventures in South America and the Far East.

Bar Mill Work Progresses

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., will complete delivery this month of more than $2 million worth of steel mill equipment for Ceco Steel Products Corp., Chicago. The machinery is being installed in an $11 million bar mill being constructed at Lemont, Ill. The mill is engineered exclusively to direct roll electric steel ingots into finished bars. It is designed to roll mild steel and will be equipped with 15 stands. The firm fabricates reinforcing steel; steel joists; steel and aluminum curtain walls, windows and screens; metal lathing products; prefabri-

(*Please turn to Page* 86)

NEW from DUN & BRADSTREET
METALWORKING DIRECTORY

A complete marketing guide to more than 30,000 metal producing and metalworking plants with 20 or more employees

The METALWORKING DIRECTORY is the most complete source of information yet compiled on the largest buying and selling units in the industry.

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1. Standard Industrial Classification Numbers—Each business classified by up to six four-digit Standard Industrial Classification numbers. You know not only the primary function of each plant, but other functions of lesser importance that are performed.

2. Number of Employees—Average number of employees at plant location. Determine your average sales per customer employee and you can measure your dollar potential with each plant.

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4. Products Manufactured—A description of the primary operation of a plant showing what they produce. You can rapidly determine if your product is a component of their product.

5. Plants Arranged Geographically in Section I—Broken down by states, by cities within states, and alphabetically by plants within cities. You can pinpoint, by name, your prospects in each sales territory. Street address and postal zone number shown for each plant.

6. Plants Shown by Product Classification in Section II—Plants are arranged according to their product classification. Over 170 four-digit Standard Industrial Classification groupings. Each plant shown under each of its product classifications. Use this section to check coverage by line of business.

7. Plants Arranged Alphabetically—Section III lists all plants nationally in alphabetical order. If you know the name of the plant, you can find its location.

8. County by County Statistical Summary in Section IV—You can quickly determine the number of plants in any line, in any sales territory—match these against the number of customers you have in each state, and immediately know how thoroughly you are covering the market. Number of employees shown indicates size of plant.

9. Secondary Breakdown Shown in Section IV—This is where you can find hidden prospects for your products. For example: Suppose you sell to foundries. Many plants produce and sell castings as a secondary part of their operation but are not well known for this function. The secondary breakdown in Section IV, will show how many companies there are of this type in each county. Section I or Section II will tell you who they are. A unique way of finding hidden prospects never before available.

Unique cross-reference system helps you compile and compare more quickly, easily, in *three ways*—geographically, alphabetically, and by products. In addition, plants are statistically summarized by states, counties, and lines of business.

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- ★ Insure prospect coverage
- ★ Set realistic sales goals
- ★ Guide salesmen to right company, right man
- ★ Prepare accurate mailing lists
- ★ Realign and expand territories and product lines
- ★ Locate new prospects in present selling areas
- ★ Budget sales and advertising dollars by area and line

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- ☐ Have your representative call to give us additional information on the National Directory.
- ☐ Have your representative call to explain the Regional Directories.

Name of Concern _____

Individual Signing _____

Address _____

City _____ *Zone* _____ *State* _____

integrated CRUCIBLE steel service

Local Crucible personnel provide service in depth, ranging from quick reports on steels available to expert assistance with metal working problems. Average warehouse staff is backed up by Crucible Metallurgists who, although located at mills, will travel.

maintains broad range of local customer services

—*ranges from in-stock deliveries to metallurgical research*

Here's *service in depth*, made possible by Crucible's integrated operation. It starts with in-stock deliveries of the steels you need and goes on to provide complete technical assistance for engineers, production, toolroom and maintenance men. And the entire service is available from all of Crucible's 32 warehouses –

(1) *Deliveries from local stocks* of 16,000 specialty steel items, including all grades, shapes and sizes.

(2) *Basic specialty steel data* – complete breakdowns on properties, characteristics, as well as machining and fabrication details. (Warehouse account salesmen can frequently recommend the best steel for the end use.)

(3) *Metalworking assistance* with unusual machining and fabricating problems – by trained, experienced sales-service engineers who specialize in tool steels, stainless, alloys.

(4) *Metallurgical research* – help in developing steels for tomorrow's more exacting applications from Crucible's metallurgists, who will come to your plant on call.

Here's what one purchasing agent recently had to say about this over-all service: "We need lots of help with new steels – ones we haven't used before. The reason we rely on Crucible warehouses is because their men know the answers – or can get them for us quickly."

Why not simplify your own specialty steel purchasing problems by taking advantage of this integrated service? *Crucible Steel Company of America, Dept. PG15, Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

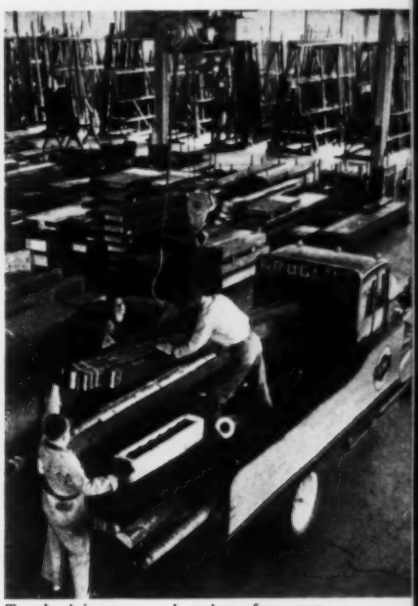
STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

Crucible metallurgists will come to your plant, if necessary, to help engineers use new steels or metals like titanium.

Sales service engineers' experience with fabricating, machining problems can solve toolroom and production problems.



Truck drivers speed orders for overnight delivery to you — or earlier if your order is an "emergency."

TOOL STEELS – Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS – Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel

ALLOY STEELS – Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

Teletype operators get direct reports on quantities available everywhere in the warehouse system — from Crucible's inventory-control computer room.

WELDING AND HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

— and many others

CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Erie, Pa. • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis St. Paul • Syracuse • Tampa • Toledo • Tulsa • Toronto, Ont.

(*Concluded from Page 82*)

cated steel buildings; and miscellaneous steel products.

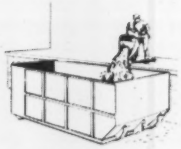
CONSOLIDATIONS

Officers of **D. S. Kennedy & Co.**, Cohasset, Mass., following merger with **Anchor Metals Inc.**, Hurst, Tex., are: Chairman, D. S. Kennedy; president and chief executive officer, C. F. Mooney; vice president, Anchor Div., J. O. Legate; vice president-engineering, R. J. Grenzeback; vice president-finance, G. L. Jackson; treasurer, M. C. Sherman; and secretary, E. Curtiss Mower.

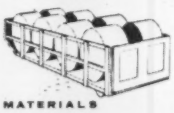
General Dynamics Corp., New York, will merge with **Material Service Corp.**, Chicago, subject to approval of stockholders. Material Service produces building materials, concrete products, and coal.

DEMPSTER DINOSAUR®

Here's the detachable container system of a hundred uses. The simple, powerful, one-man DEMPSTER-DINOSAUR automatically picks-up . . . hauls . . . dumps . . . puts down . . . or pushes off on dock, loads limited only by the size of the truck or by highway restrictions. All handling operations are performed without the driver leaving the cab . . . no cables to hook on . . . no chains . . . . . . sheaves . . . winches. Models available for single or tandem axle chassis . . . 22,000 to 30,000 pound gross loads. Containers, six to 40 cu. yds. and over, available for refuse, scrap, materials handling, cargo, "boxy-back" rail shipments and many other uses. Write today for brochure or for a demonstration in your city.



REFUSE AND SCRAP COLLECTION



MATERIALS HANDLING

"BOXY-BACK" RAIL TRANSPORT

CARGO HANDLING

Patents Pending DEMPSTER BROTHERS INC.

Made Only by DEMPSTER BROTHERS, the Originator and Only Manufacturer of the DEMPSTER-DUMPSTER Systems

DEMPSTER DUMPSTER SYSTEMS ®

Free Illustrated Brochure
Write Today For Your Copy

DEMPSTER BROTHERS KNOXVILLE 17, TENN., DEPT. NO. S-7

Pullman-Standard Car Mfg. Co. has merged with its parent company, **Pullman Inc.**, Wilmington, Del., and is being operated as the Pullman-Standard Div.

Rockwell-Standard Corp., Coraopolis, Pa., acquired **Air-Maze Corp.**, Cleveland, manufacturer of industrial liquid and gas filters.

Ring Punch & Die Inc., Jamestown, N. Y., has merged with **Producto Machine Co.**, Bridgeport, Conn. C. Ernest Larson and E. M. Johnson, former officers of Ring Punch & Die, have become vice presidents of Producto.

Indiana Steel Products Co., Valparaiso, Ind., and **General Ceramics Corp.**, Keasbey, N. J., will merge subject to approval of stockholders. The two companies would continue as separate divisions. Indiana Steel makes permanent-magnet materials; General Ceramics, ceramic and ferrite products.

A merger between **Ehret Magnesia Mfg. Co.**, Valley Forge, Pa., and **Baldwin-Hill Co.**, Trenton, N. J., is proposed. If approved by stockholders, the new company will be known as Baldwin-Ehret-Hill Inc. with main offices at 500 Breunig Ave., Trenton, N. J. Ehret makes magnesia and calcium silicate high temperature insulations. Baldwin-Hill makes mineral wool thermal insulations and acoustical products.

NEW PLANTS

Whitehead Metals Inc., New York, opened new facilities in Syracuse, N. Y. The building has 40,000 sq ft of warehouse area and 5000 sq ft of office space. The subsidiary of International Nickel Co. Inc. will carry stocks of nickel, high-nickel alloy, aluminum, copper, and stainless steel products. Services will include shearing of sheets and sawing of heavy plates to customers' specifications.

Michael Flynn Mfg. Co., Philadelphia, opened a plant for fabricating aluminum building products at City of Industry, a suburb

(*Please turn to Page 90*)

BARBER COLMAN

Founded in 1900 for the purpose of building textile machinery, Barber-Colman Company today produces diversified equipment and products for such fields as automotive, aviation, machine tool construction and textile.

Versatile ACIPCO

centrifugally spun TUBES

. . . for super speed warpers

Barber-Colman Company, Rockford, Illinois, manufactures more than 85% of the section beam warpers produced in the world. And Barber-Colman specifies ACIPCO Centrifugally Spun Cast Iron Tubes as supplied through our mid-west distributor, C. A. ROBERTS CO.

The Super Speed Warpers produced by Barber-Colman have a winding speed of 900 yards per minute yet these units are also engineered for low and uniform tension to produce a beam in which thread ends are stressed alike.

Specifications for the machines are strict: tubular metal parts must be machined to a fine finish and to precise measurements. They must have high strength and be balanced so that they are capable of withstanding sustained high speeds. ACIPCO tubes **custom-fit** requirements such as these.

Centrifugally Spun ACIPCO tubes have a dense, non-directional grain structure which is easier to machine. Important, too, their **inherent** dimensional stability and concentricity makes dynamic balance easier to attain in finished products.

If your machines or products employ tubes of stainless steel, carbon steels, alloy irons, or special analyses as components, it will pay you to investigate ACIPCO. Call or write for complete information on ACIPCO tube applications in your field. No obligation, of course.

SIZE RANGE: Lengths up to 410″ have been produced to meet modern machinery requirements. OD's from 2.25″ to 50″; wall thicknesses from .25″ to 4″.

ANALYSES: All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel, plain carbon steel and special analyses.

FINISHED: As cast, rough machined, or finished machined, including honing. Complete welding and machine shop facilities for fabrication.

SPECIAL PRODUCTS DIVISION

AMERICAN CAST IRON PIPE CO.

ACIPCO

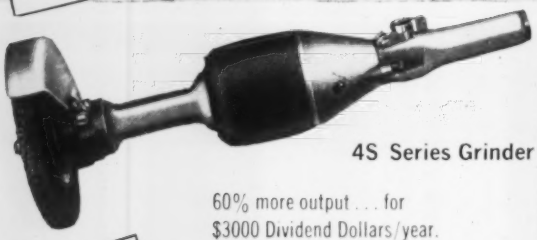
BIRMINGHAM 2, ALABAMA

NEW SERIES IR GRINDERS

to give you an ANNUAL DIVIDEND on your PAYROLL DOLLARS

NEW *DESIGNS SPEEDS POWER*

NEW



4S Series Grinder

60% more output . . . for $3000 Dividend Dollars/year.

NEW

001 Series Grinder

25% more output . . . for $1250 Dividend Dollars/year.

NEW

42F Series Grinder

25% more output . . . for $1250 Dividend Dollars/year.

NEW

2G Series Grinder

17% more output . . . for $850 Dividend Dollars/year.

If your operators are using older model grinders, you can increase their man-hour productivity by as much as $3000 Payroll Dollars in one year, just by replacing the older tools with one of the new I-R designs.

Multiply these *Annual Dividends* by the number of grinder operators in your plant, and you can see why management today is taking a new look at portable tool operations.

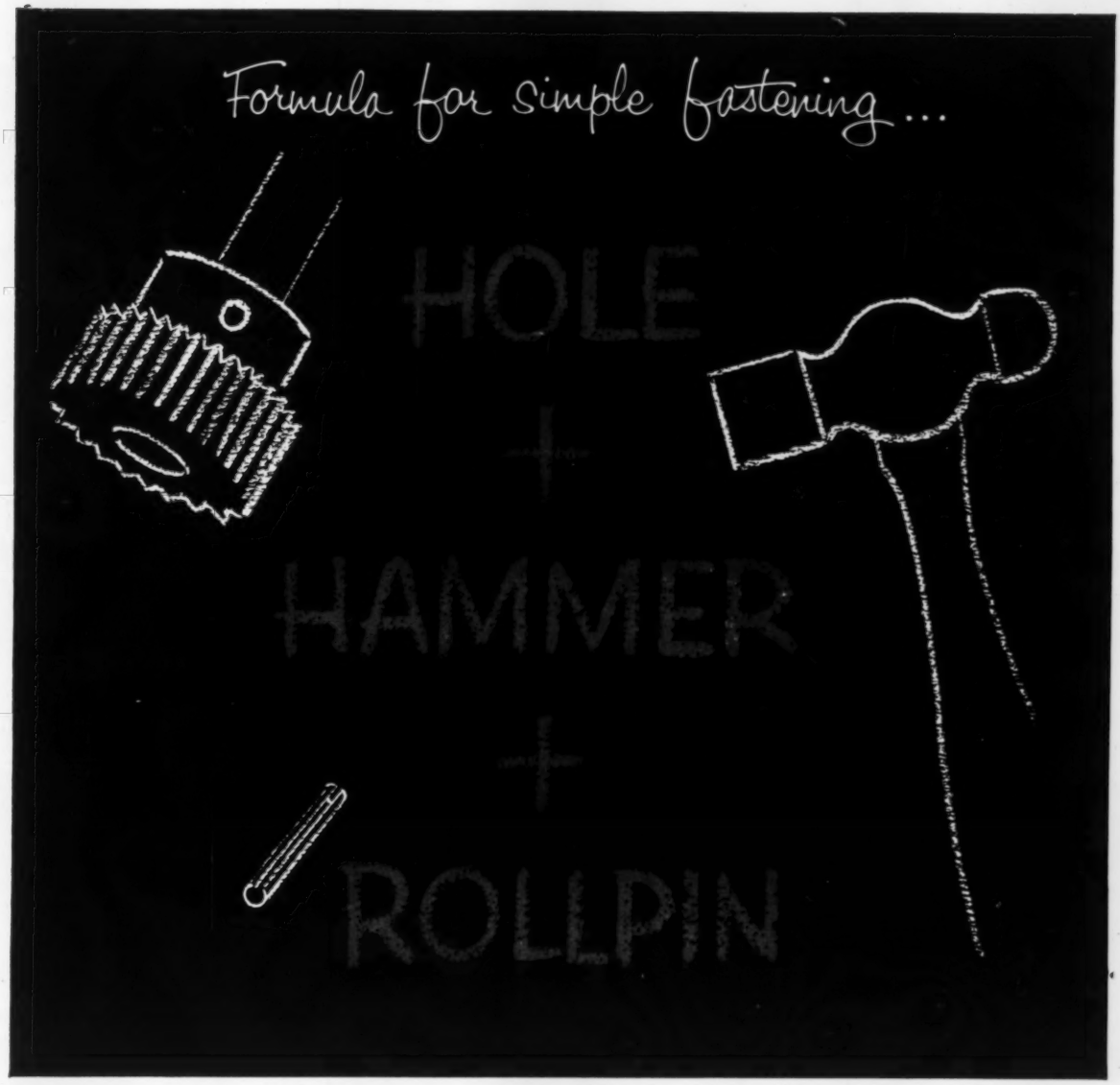
There's a fast, easy way to calculate the amount of *Dividend on Payroll Dollars* these new I-R grinders can help you earn in just one year—without adding to your present payroll.

It's yours without obligation. To get it, call your I-R AIRengineer today. Or write Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand

Tools plus AIRengineering increase output per man

8-923



If you use locating dowels, hinge pins, rivets, set screws . . . or straight, knurled, tapered or cotter-type pins—you should look into the savings in time and money offered by the Rollpin formula. **(1)** You start with a straight production-drilled hole—no threading, peening or precision drilling is needed. (For example: permissible and typical hole tolerances for effective Rollpin installation are .125-.129 for the ⅛" diameter pin; .250-.256 for the ¼" pin.) **(2)** You need no more than a hammer . . . simply modified hand tooling, arbor press or hydraulic press to set the Rollpin into a secure, vibration-proof fit. **(3)** You just drive the Rollpin into the hole . . . and that's it. Spring action locks the Rollpin in place . . . regardless of impact loading, stress reversals or severe vibration. Yet it is easily drifted out . . . and can be re-used in the same hole. For information on how Rollpin can simplify your fastening jobs, fill in and mail coupon below.

ROLLPIN®

ESNA

A PRODUCT OF

ELASTIC STOP NUT CORPORATION OF AMERICA

Elastic Stop Nut Corporation of America
Dept. R56-760 2330 Vauxhall Road, Union, New Jersey

Please send the following free product information:

- ☐ Rollpin dimensional data
- ☐ Rollpin installation suggestions
- ☐ Here is drawing of our product. What self-locking fastener would you suggest?

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

(*Concluded from Page 86*)

of Los Angeles. Facilities include equipment for aluminum extrusion.

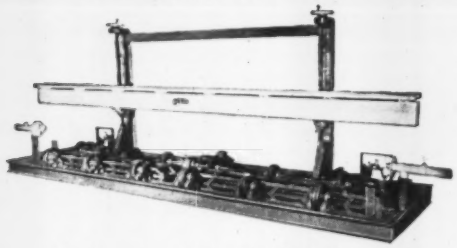
Acoustica Associates Inc. has consolidated its executive headquarters and Eastern Div. production and research operations in a new plant in Plainview, N. Y. Acoustica, a manufacturer of ultrasonic systems, also has plants in Los Angeles, Culver City, and Santa Barbara, Calif.; and Hartford, Conn.

VACATIONS

Torrance Works, Columbia-Geneva Steel Div., U. S. Steel Corp., will be shut down from July 12 through July 25; the mill's Open Hearth Dept. will remain on vacation through Aug. 1. The 22 in. rolling mill is scheduled to resume operations at 8 a.m., July 27; the 12 in. rolling mill, 8 a.m., July 26; the Open Hearth Dept., 12:01 a.m., Aug. 2.

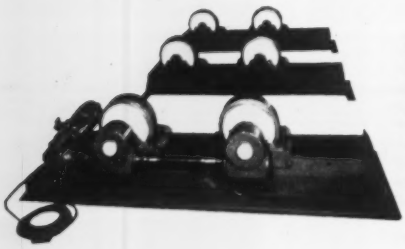
WEBB TANK PRODUCTION MACHINERY

REED TRACK SUPPORTS For Automatic Welding Head Carriages

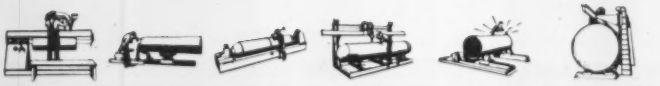


Increase production — use this fixture on 4' to 12' diameter work. Welding track is 24' to 34' long. Powered vertical adjustment is available for all models. May be used with your present turning rolls, welding positioners, special jigs for straight seam work, or portable type rolls illustrated below.

REED Portable Type TURNING ROLLS



For manual or automatic welding and other operations requiring rotation of a cylindrical vessel. Capacities range from 3 tons to 75 tons; larger units built to special order. Powered by electric motor with variable speed transmission. Readily portable, they may be used free or anchored to the floor as desired.



Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

FOR ILLUSTRATED LITERATURE WRITE DEPT. D

Since 1881 THE WEBB CORP.
REED EQUIPMENT DIVISION
WEBB CITY, MO., U.S.A.

ASSOCIATIONS

Alloy Casting Institute, Mineola, N. Y., elected these officers: President, J. B. Dear, Duraloy Co., Scottdale, Pa.; executive vice president and treasurer, E. A. Schoefer, Garden City, N. Y.; and vice president, J. S. Wooters, General Alloys Co., Boston.

Thomas O. English, general purchasing agent for Aluminum Co. of America, Pittsburgh, has been elected president of the **National Association of Purchasing Agents,** New York.

Drop Forging Association, Cleveland, elected these officers: President, L. M. Fehrenbach, Indianapolis Drop Forging Co., Indianapolis; vice president, E. W. Cress, Buchanan Steel Products Corp., Buchanan, Mich.; and executive vice president, D. M. Allgood.

John F. Partridge, assistant secretary of **American Steel Foundries,** Chicago, was elected secretary and counsel, succeeding Orrin B. Garner. Walter L. Schlegel Jr. was appointed assistant secretary and chief patent attorney; and M. C. Holmes, assistant secretary.

Western Electronic Manufacturers Association (formerly West Coast Electronic Manufacturers Association), Los Angeles, elected these officers: President, J. A. Chartz, Dalmo Victor Co., San Carlos, Calif.; secretary, J. D. McLean, Hoffman Laboratories, a division of Hoffman Electronics Corp., Los Angeles; treasurer, P. L. Gundy, Ampex Corp., Redwood City, Calif.; and vice presidents, R. B. Leng, Packard-Bell Electronics Corp., Los Angeles; William Ivans Jr., Cohu Electronics, San Diego, Calif.; and L. R. Rockwood, ESI Inc., Portland, Oreg.

J. B. Arthur, founder of Mexico Refractories Co., Mexico, Mo., a division of Kaiser Aluminum & Chemical Corp., Oakland, Calif., was elected president of the **Refractories Institute,** Pittsburgh.

When you think

of product development

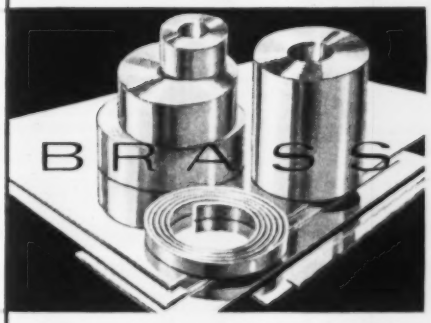
think of brass...

especially Western Brass...

it's "tailor-made" for each job.

Western

*



WESTERN IS A TRADEMARK

* Sheet and Strip Specialists in Brass and Copper *

THE MAN FROM WESTERN IS ONLY A PHONE CALL AWAY

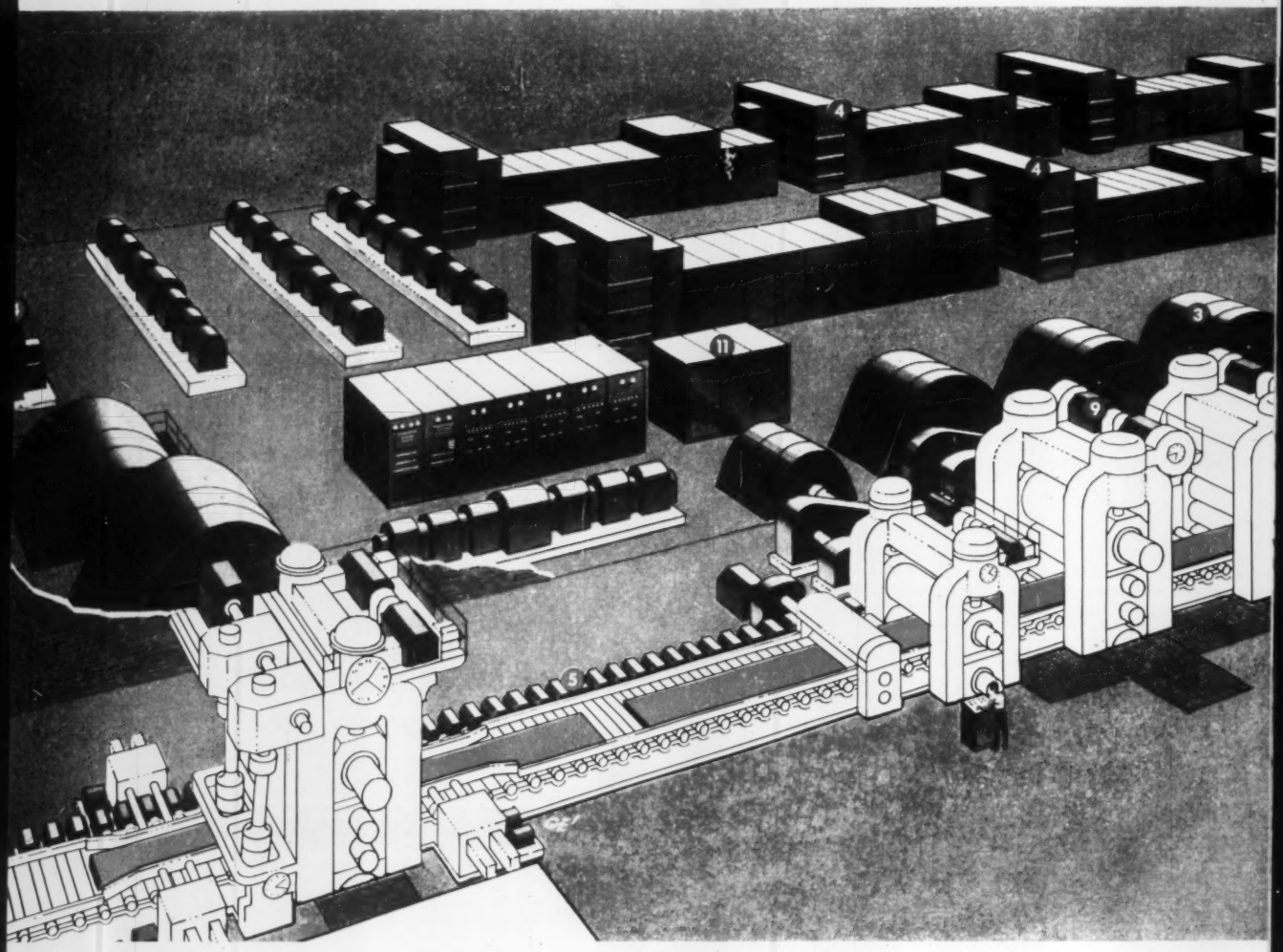
OLIN MATHIESON CHEMICAL CORPORATION

Western BRASS

MILLS: East Alton, Ill., New Haven, Conn. • SALES OFFICES: Boston • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Decatur, Ga. • Detroit Grand Rapids • Indianapolis • Long Island City • Los Angeles • Milwaukee • New Haven • Philadelphia • Rochester • Rockford, Ill. • Saint Louis

General Electric's new program for Automation through Modernization will help you . . .

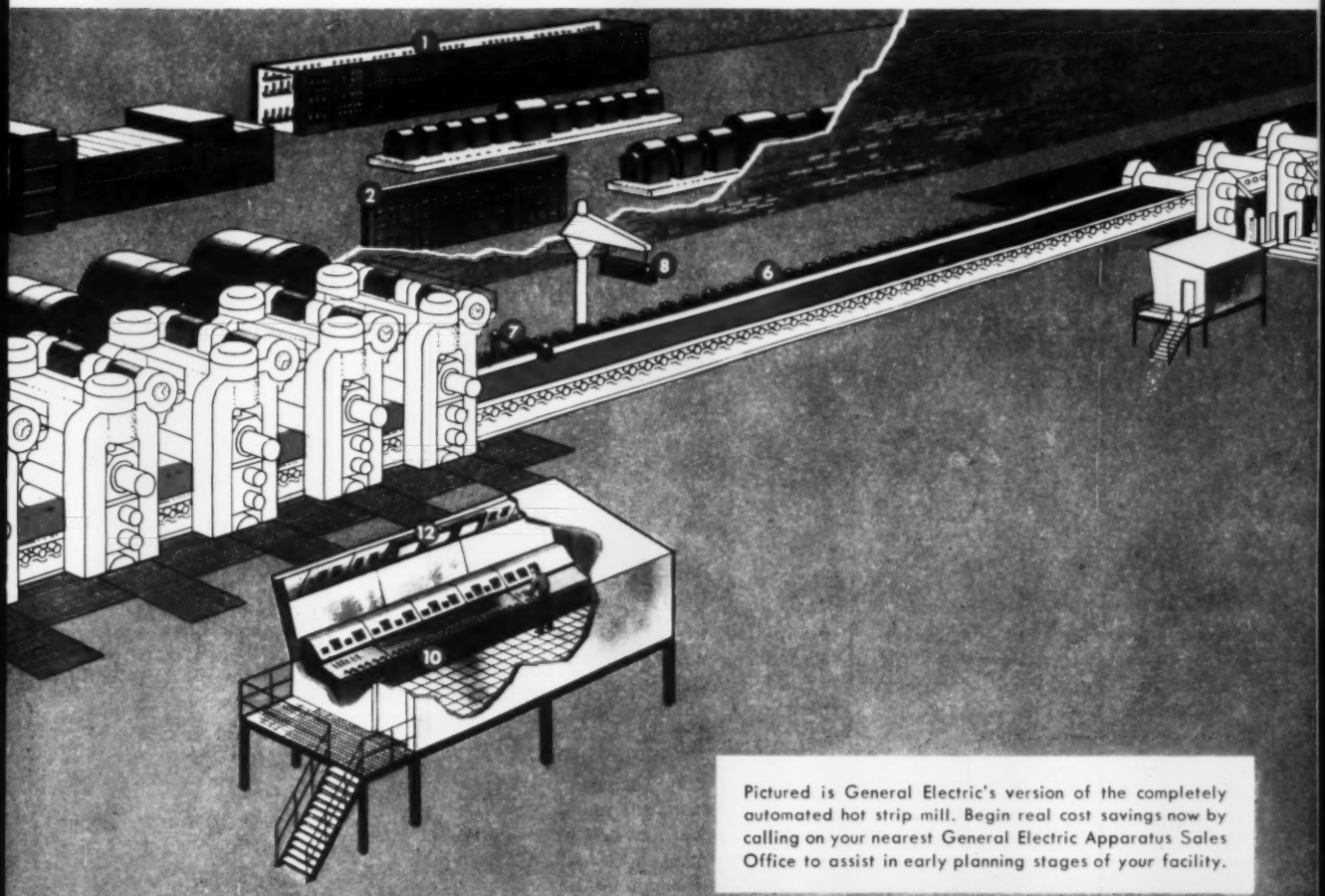
REDUCE SCRAP LOSSES, MODERNIZE FOR PROFITS



GENERAL ELECTRIC CAN AUTOMATE YOUR MILL TODAY

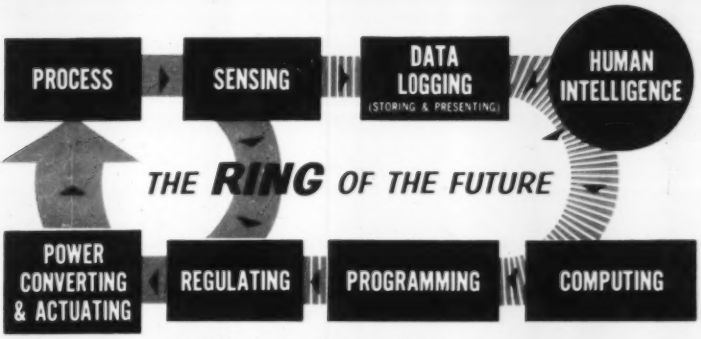
1. Main mill control, complete with stand speed regulators, utilizes quick-response *DIRECTO-MATIC* static control to perform complex functions of automation, such as automatic roll positioning.
2. Automatic gage control provides accurate gage throughout the entire strip.
3. Main drive motors incorporate unique features to cut installation cost, provide more accessibility, low maintenance, increased reliability.
4. M-G sets or mercury-arc rectifiers, depending on application requirements and operating conditions, provide reliable d-c power to main drive motors.
5. MD-600 motors individually power intermediate delay tables, eliminating reduction and bevel gears, lowering maintenance.
6. Especially designed MDY d-c motors for runout-table give long, dependable service under all operating conditions.
7. New RAYMIKE 600 x-ray thickness gage provides high accuracy over long periods of time with great reliability.
8. Width gage measures strip without contact, provides visual indication to operator through digital readout device and can be used in automatic gage control to avoid variations in strip.
9. MD-600 motors provide ruggedness, instant response and low maintenance to the most vital mill operation.
10. Control console keeps operator in constant touch with all mill operations.
11. Data processing equipment records data, sets up operating guides, ultimately controls the process using the G-E 312 digital control computer.
12. Closed-circuit TV gives visual contact with all remote and inaccessible mill functions.

One of the many benefits of automating your hot strip mill will be a significant reduction in scrap losses. Major advances in regulation of stand speeds minimize looping and stretching. Automatic gage control can reduce strip cobbles by as much as 27%, decrease lost rolling time due to cobbles 35%. Step-by-step implementation of General Electric's "Ring of the Future"* will provide you with these and many other benefits of automation through a profitable plan of modernization. For full details on Automation through Modernization, mail the coupon below, today.



Pictured is General Electric's version of the completely automated hot strip mill. Begin real cost savings now by calling on your nearest General Electric Apparatus Sales Office to assist in early planning stages of your facility.

THE "RING OF THE FUTURE" KIT IS GENERAL ELECTRIC'S GUIDE TO AUTOMATION THROUGH MODERNIZATION. ***Write for your kit today.***



*Copyright 1958, General Electric Company

TO: SECTION 804-3
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, NEW YORK

Please send me G.E.'s "Ring of the Future" kit.

Name_____

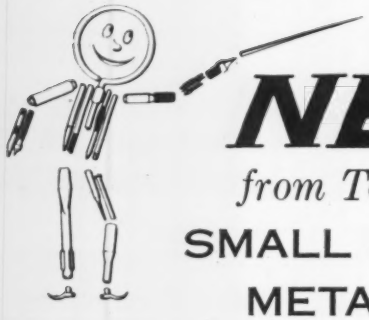
Position_____ Company_____

Address_____

City_____ State_____

Automation Through Modernization

GENERAL ELECTRIC

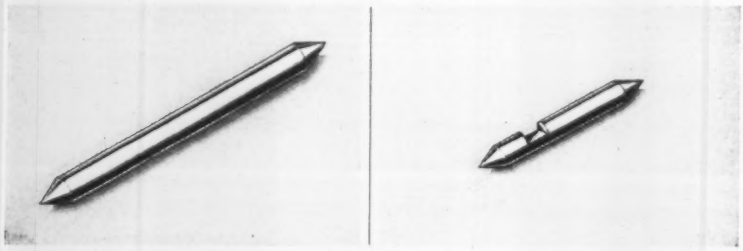


NEWS

from Torrington on

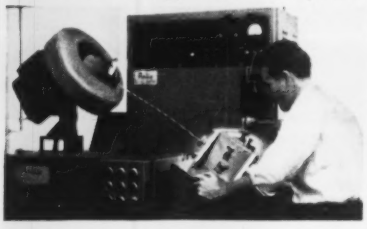
SMALL PRECISION METAL PARTS

"Custom manufacture" has many meanings to the Specialties engineers here at Torrington. One of our customers, for example, may require a part having fairly wide tolerances of several thousandths. The very next job on an engineer's desk may present a real challenge, calling for a complex series of manufacturing operations and a precision measured in ten-thousandths. Torrington's unmatched experience, engineering skills and facilities are ready to serve you *whatever* your particular requirements might be.



A comparatively simple job now going through calls for train axles for HO gage model equipment. The length tolerance is held to .010" and the diameter tolerance is .002". Our engineers complete the whole operation on super high-speed blanking machines designed by Torrington which operate at much greater speeds than available with other commercial equipment. Result . . . substantial savings on a low-cost, high-volume item for our customer.

In contrast to this, a current contract with one of America's leading clockmakers calls for a balance shaft with a diameter tolerance of .0005". If the shaft is supported at the points and rotated, the OD must rise and fall a maximum of .0015" during one revolution. Specialties engineers meet these more demanding specifications with a machine that will cut, form and mill in a single high-speed operation perfected by Torrington. Usual expensive burnishing is replaced by a much faster and far less expensive method to produce a fine finish. Result . . . another example of our ability to adopt new methods in solving a customer's problem economically.



A special engineering department is maintained by the Specialties Division to help you solve any problems involving small metal parts. If required, our highly experienced and skilled engineers will help you design the part for most efficient and economical production. More and more manufacturers are turning to specialized Torrington service. If small precision metal parts are *your* problem, just circle our number on the reply card, call our area salesman, or write direct to:

The Torrington Company, Specialties Division, 900 Field Street, Torrington, Conn.

TORRINGTON SPECIAL METAL PARTS

Makers of Torrington Needle Bearings

Coming Aug. 17

Increasing Research, Development

The changing role of metalworking managers is nowhere more dramatic than it is in the area of research and development. The function, once the exclusive province of university professors and scientists, is gaining increasing recognition as a major weapon on two industrial fronts: The battle for markets and the battle against rising costs.

Although managers don't necessarily have to be scientists, they should know more about the techniques and problems of R&D to make better use of its results. To learn how managers can equip themselves for the new role, see the next article in STEEL's 1959 Program for Management.

Articles in the series published to date:

1. **Profile of Metalworking's Managers (Feb. 16, p. 137).**
2. **Improving Productivity (Mar. 16, p. 103).**
3. **Keeping Wages in Line (Apr. 13, p. 95).**
4. **Giving More Public Service May 18, p. 99).**
5. **Meeting Foreign Competition (June 15, p. 131).**
6. **Keeping Pace with Technology (July 13, p. 95).**

An extra copy of these Program for Management articles is available until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

THE CHANGING ROLE OF METALWORKING MANAGERS

Keeping Pace with Technology

A WEST COAST aircraft plant is extruding complex steel sections with 0.005 in. wall sections. No machining is required. Grain is good. Tolerances are good.

The typical plant producing a similar part is probably starting with an extrusion that has walls at least 0.120 in. thick and machining to the thinner dimension.

Far too many metalworkers who could profitably employ the second method are machining such sections directly from bar stock. Total cost: Probably four to six times that of the aircraft plant.

The examples show three ways to get a job done. They also represent three types of companies:

1. The aircraft maker, one of metalworking's leaders, is setting the pace by creating new technology.

2. The aggressive firm keeps pace with the latest technological developments—it'll be using the aircraft extrusion technique tomorrow.

3. The vulnerable company is always two or more steps behind the leader. It is the potential victim of our nation's galloping technology. You can probably name several firms which have gone out of business or sold out because they didn't keep pace with technology.

How vulnerable are you and your company? Does your company encourage its managers to keep pace with technology? Do you have a personal program? What are your objectives?

Willard F. Rockwell Jr., president of Rockwell Mfg. Co., says management people need far greater understanding of technology.

Does this mean all managers must obtain scientific or engineering degrees? "No," points out Mr. Rockwell. "But they should possess more than a man-in-the-street back-

ground. They need to develop a feel for technical things. The manager must learn what kind of information to demand from those who are by training technically qualified to supply it. The manager must then have the ability to evaluate, make judgments, and act."

It's Your Responsibility

Keeping pace with technology is the responsibility of all managers. It's not the private domain of research and development people. The importance of the feel for technology that Mr. Rockwell stresses is obvious in top management's long range planning. Purchasing, with its liaison role with outside venders, has a major responsibility in reporting new developments in components, processes, and materials to engineering, manufacturing, and R&D. Industrial relations must be alert to changing technology in its planning and training programs.

"The team concept in industry has evolved because technical advancements have been so rapid," says L. C. Rotter, chief engineer of Lincoln Engineering Co. "To be effective on the team, the individual must learn to think beyond the scope of his job."

Setting up the Offense

Keeping pace with technology takes a three pronged attack:

1. An effective internal system of communications must be established so that information fans out quickly from one function to all others. Small and medium sized firms have an obvious advantage over large.

2. An aggressive program of bird-dogging developments in your own and all industries is increasingly important. Even though your major activity may be in steel, you can't afford not to keep up to date on aluminum and plastics.

3. The impact of foreign competition is forcing many firms to set up programs for keeping tabs on technological developments overseas as well as those at home.

"Setting up the mechanics of such programs is relatively easy," says an executive vice president: "The woods are full of programs and opportunities—but their effectiveness is in direct proportion to the enthusiasm of the individual manager."

Tools for Motivation

The best way to encourge the manager is to maintain an atmosphere of personal participation. Let the individual be the "generator" as well as the "receiver" of technical information disseminated throughout the organization. Give the Indians as well as the chiefs:

- Opportunities to attend out-of-town technical meetings.
- Subscriptions to technical and business magazines—a cut above routing slip status.
- Opportunities to join and participate in professional and technical society activities, with the company footing the bill.
- Invitations to make oral reports about new developments to top management's product development and planning committees. You'll be surprised how much more information a middle or lower level manager can assimilate at a conference when he knows he'll be reporting to "the top brass."

The ideal internal communications system, believe many executives contacted by STEEL, would be the establishment of a technical information co-ordinator. All functions of management would report technological developments in their fields to the co-ordinator. He would review the developments, condense the highlights, and see that the information gets to the proper manager—by reports, special

How to Keep Pace—W.F. Rockwell Jr.

TODAY, obsolescence closely follows invention. While the steam locomotive survived the introduction of the diesel for nearly 30 years, the commercial turboprop airliner has survived the introduction of the commercial jet by only three years. Television became a nearly universal household fixture within five years, though the telephone took 50 years to gain comparable acceptance.

Our exploding technology irrevocably and increasingly engulfs us. Engineers are but one element—indeed a small percentage—in our managerial echelons.

We have a widely accepted, modern concept that technical people should have some formal training in the humanities. I submit that we play turnabout and insist that our nontechnical managers—presumably knowledgeable in the humanities—be exposed to formal college level survey courses in technology.

Our colleges should add a thorough going survey course in basic patterns in technology to its business administration, law, and financial curriculums.

But our technological explosion is upon us now—we can't afford to wait for today's college students to reach professional maturity.

A more rigorous formal program of technical indoctrination for management is urgently needed now.

Explosives Shatter Old Ideas

EXPLOSIVES in metalworking are opening new horizons and challenging comfortable ideas about the physical properties of metals (formability, ductility, and hardness, for example).

A year ago perhaps a scant dozen firms were doing explosive metalworking. Today, around 40 are either in regular production or doing research and short runs of metal parts. Not all of them are producing for missiles and aircraft. Many find the technique profitable for regular nondefense applications.

Take railroads: Frogs and switch crossovers are hardened with explosives. Some tank manufacturers are explosive forming the hemispherical heads on 35 ft tanks. (It's cheaper and does a better job than conventional methods.) One firm explosively forms outsize stator rings for big power generators.

Here are some of the things that can be done:

- **FORMING**
- **EXTRUDING**
- **FORGING** (hot & cold)
- **HARDENING**
- **SHEET FLATTENING**
- **HIGH SPEED MACHINING** (still experimental)
- **CUTTING**
- **EMBOSSING WITHOUT DIES**

Convair, a division of General Dynamics Corp., San Diego, Calif., has a machine which uses forces similar to those of explosives. Called Dynapak, it employs compressed nitrogen at 2000 psi to push a ram into a die at supersonic speeds. A heated part can be formed almost instantly to unusually complex shapes and to tolerances thought impossible by conventional forging people. It is the first example of a machine for production.

Sizing die for Bomarc missile fuel cell is loaded, assembled . . .

Technicians lower explosive into water filled assembly . . .

A dull thud and the cell is accurate to within 0.001 in.

technical meetings, or in any form the situation demands. Few firms can boast the ideal—but here are some of the techniques being used.

Try These

1. **Internal technical publications.** The production engineering section of General Motors Corp.'s Process Development Staff gets out a monthly newsletter to 3000 corporate members. It outlines technical developments within the company. Thirteen committees feed information and ideas into the section which prepares the newsletter.

A. O. Smith's procurement division distributes monthly and weekly reports to operating and research and development personnel. One is its *Operation Value Analysis News-Flash* which outlines new technological developments and products being used by A. O. Smith and other firms.

2. **Circulate salesman call reports.** This is an important phase of Rockwell Mfg.'s program to keep engineers and managers up to date. Reports are screened for: Spot product successes, as well as failures, and areas for improvement; ideas for new products; new applications for present products; evaluation of competing products by users.

3. **Plant visits.** This activity is rated among the best by most executives. Visits include trips to different divisions within the company as well as to supplier and customer plants. One manufacturing vice president advises: "Don't overlook the medium and small plants. You can learn from those fellows."

4. **Publication surveys by private news clipping concerns or your own public relations department.** Smaller firms distribute magazine and news-

Are You Keeping up with Machining

NEARLY every time a product designer turns out a new drawing, tolerances are trimmed, and materials have higher properties.

Result: The production department has a few new problems.

Looking at the situation one way, it's an inevitable part of the continuing strugggle to upgrade product performance.

But, more importantly, experience often isn't a reliable guide.

For example, machinability tests at Metcut Research Associates Inc., Cincinnati, prove that even a good machinist can make costly mistakes in such things as tool selection if his experience is limited to less difficult materials.

• To increase your awareness of such problems, STEEL has prepared a short quiz. The questions in the adjoining column will give you an opportunity to check your knowledge against test results. Read the remainder of this column for background information.

PROBLEM NO. 1 is designed to show that normal tool selection can be costly in terms of tool life. Two choices are involved: An M-7 high speed steel cutter and a T-15 high speed steel cutter.

PROBLEM NO. 2 involves this question: To get maximum tool life, should an off-the-shelf or modified tool be used? Both are carbides (C2). Tool life is considered in terms of cutting speed and feed.

PROBLEM NO. 3 illustrates the importance of specifying the right hardness. Your engineers, for example, might specify a range of 49 to 52 Rockwell C for two reasons: 1. They figure that performance would be assured if the material were anywhere in the range. 2. They figure that the range would make the part easier and less expensive to heat treat.

All tests were done by Metcut.

Please go to Problem No. 1.

PROBLEM No. 1

JOB: End Mill 4340 steel quenched and tempered to 49 Rockwell C.

GOAL: Maximum tool life (inches of work travel).

SELECT BEST TOOL:
M-7 HSS four flute end mill?
T-15 HSS four flute end mill?

PICK RECOMMENDED CUTTING SPEED:
Range, 40 to 80 ft per minute.

PICK RECOMMENDED FEED:
Range, 0.0005 to 0.0020 in. per tooth.

PROBLEM No. 2

JOB: End mill 4340 steel quenched and tempered to 52 Rockwell C.

GOAL: Maximum tool life (inches of work travel).

SELECT BEST TOOL:
Off-the-shelf tool—1½ in., four tooth carbide (C-2) end mill, with shank 1 in. in diameter, fluke length of 1½ in.
Same tool modified—shank 1¼ in. in diameter, fluke length 1 in.

PROBLEM No. 3

JOB: End mill 4340 steel.

GOAL: Maximum tool life with high speed steel cutters.

SELECT MOST ECONOMICAL HARDNESS RANGE:
49 to 52 Rockwell C.
49 to 50 Rockwell C.

paper articles of interest to managers. Larger firms often assign someone the task of getting the clippings, condensing them into pithy paragraphs and putting them into a newsletter.

5. **Technical forums.** Minnesota Mining & Mfg. Co. sponsors a three-day convention for its technical employees. In the forum last December, over 1700 attended symposiums conducted by 3M technical groups and outside speakers.

Like many other companies, 3M also tries to arrange for venders to present technical sessions which inform managers of developments in the vender's field. Check with your purchasing people; they can find out which of your venders offer such programs.

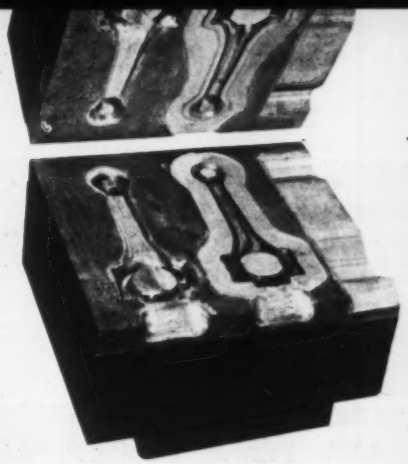
6. **Educational grants.** Our rapidly changing technology is creating some serious casualties in our technical staffs. Several executives pointed up the problem of the "over 45" engineer and technical manager who is over his head in much of the advanced technology—he's no match for the whiz-kid fresh off the campus.

"How do we help the over-45 man keep pace with technology moving so rapidly in fields like electronics?" ask the executives. "Many of the advances originate in campus laboratories."

R. F. McGinn, vice president of research and development for A. O. Smith, believes one solution is to send the man back to college. Yet he's probably a key manager and the question of whether he can be spared is important.

7. **Company technical and management clubs.** The trend here is away from the social to the information exchange types of organi-

Technology?



How Would You Do This Job?

Say you had to sink die blocks for automotive connecting rods. If your plant is a modern one getting its share in a competitive business, you might well do this job by tracer controlled milling.

Experts at Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., figure it could be done in about 120 hours. The operation might cost in the range of $10 to $20 an hour. At $12 an hour, you'd spend roughly $1440.

But if your plant has made equipment and technological changes to make you more competitive today, and in the future, you might well be sinking these dies on a numerically controlled machine. G&L engineers figure this way the hourly machine cost would be higher, say $20, but you could get the job done in 47 hours. It would cost you only $940. You save $500.

A limitation here: You'd spend about 30 hours making templates vs. about 120 hours programing the numerical control. But after you have made four dies, you would have paid for the programing—and the dies often are made at the rate of one or two a month. On more complex dies, the payoff will come even faster.

Further, if you are keeping pace with technology, you are closely watching the development of electrical discharge diesinking. Proponents at Elox Corp., Royal Oak, Mich., point out that once a master cavity or a part model is made, they cast and coin metal electrodes that can produce succeeding tools at relatively low costs. When the worn dies need to be resunk, electrical discharge machining can do the job in about a third the time needed to cut the original, and it can be done without annealing, machine refacing, other usual preparatory processes.

ANSWERS TO No. 1

BEST HARDNESS: 49 to 50 Rockwell C.
REASON: Tests showed that with all other conditions constant, cutter life falls from about 58 in. on 49 R_c material to about 7 in. on 52 R_c.
It may pay to trim hardness tolerance ranges even though heat treat costs are higher.

ANSWER TO No. 2

BEST TOOL: The modified one.
REASON: Tests showed off-the-shelf tool (the normal choice) didn't have enough rigidity.
TEST RESULTS—TOOL LIFE:
Best speed: 50 to 60 fpm, a compromise. **Slower speeds caused severe chatter; faster speeds sacrificed tool life.**
Best feed: 0.015 to 0.002 in. per tooth (vs. a normal 0.003 to 0.004 in.) **boosted cutter life ten times.**

ANSWER TO No. 3

BEST TOOL: T-15 HSS.
RECOMMENDED CUTTING SPEED: 50 to 62 fpm.
RECOMMENDED FEED: 0.0008 to 0.0013 in.
TEST RESULTS—TOOL LIFE:
T-15 HSS: 60 to 64 in. at recommended cutting speed.
M-7 HSS: 46 to 50 in. at normal speed (38 to 50 fpm).
T-15 HSS: 65 to 72 in. at recommended feed.
M-7 HSS: 25 to 33 in. at normal feed (0.0010 in. to 0.0016 in.).

zation. Hotpoint's engineering society (250 members) is typical. It meets periodically and plans programs of technical interest. Guest speakers include university professors, magazine editors, and representatives of other companies.

8. **Establish technical libraries.** Most large companies have technical libraries or reference rooms. The major shortcoming (other than trying to encourage greater use of them) is in administration. A trained librarian is a necessity for a library of any size. Some executives want colleges to offer library training to engineers as a specialized career.

Sheer volume of material may discourage a library's use. Mr. McGinn of A. O. Smith and his associates are investigating the possibilities of putting information on IBM equipment and crosscoding it.

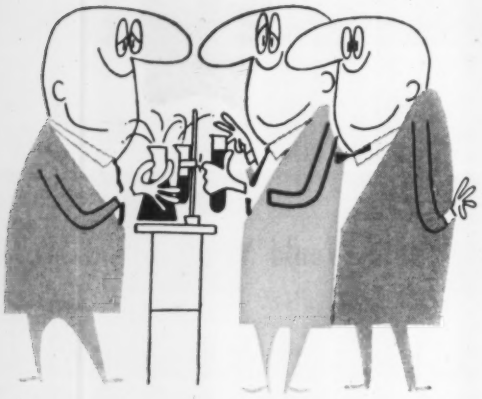
Watchdogs on the Outside

The axiom, "you're only as good as your contacts," holds true in keeping pace with technology. Your best outside sources for information are your industry associations, business magazines, colleges, universities, and the government. Many medium and small sized firms are overlooking the potential of universities and government.

Each year the federal government finances over $2.5 billion worth of basic and applied technical research. Although primarily devoted to defense, it involves the development of many new products and processes in every industrial field—ceramics, electronics, atomic energy, plastics, instruments, lubricants, and metals.

Nonclassified reports are in the

What's New in Nonferrous Technology



ZINC STUDIES ARE AIMED FOR:

- Better finishes for diecastings to improve surface and corrosion resistance.
- New diecasting alloys with improved physical properties, castability, creep resistance, and finishing characteristics.
- Minimizing wet storage stains of galvanized products by coating.
- Longer life of galvanized hot water storage tanks by modifying alloy compositions and changing engineering designs.
- Improvement in tint retention, durability, nonchalking action, and resistance to mildew of zinc oxide paints.
- A market for rolled zinc in architecture.
- Protection of cargo compartments in tankers with zinc anodes.
- Use of zinc powders as an alternate for coating steel to give coatings higher creep and physical strength.
- Vacuum metallized zinc galvanized products.
- Processes to make better extrusions and economical forgings.

LEAD RESEARCHERS SEEK:

- Continuous casting of cable sheathing to eliminate press downtime, lower production costs, give uniform metallurgical qualities.
- Re-evaluation of alloy systems through study of precipitation hardening, work hardening, and creep.
- A practical method to manufacture wrought products via powder metallurgy to obtain improved shielding materials and develop new products.
- Products with improved corrosion properties and better dynamic properties.
- Development of widespread uses for sound and vibration attenuation.

public domain. The Technical Division of the Office of Technical Services, Commerce Department, was established in 1950 to collect these reports, reproduce them, and sell them at a cost covering only printing and handling.

Reports come from Atomic Energy Commission, Naval Ordnance Laboratory, Air Force Cambridge Research Center, and from universities and private commercial laboratories. Available, too, are thousands of German reports captured by the Allies in World War II.

Reports having wide interest are reprinted and are readily available. Those of limited interest are filed in the Library of Congress and are easily obtained in microfilm or photocopy.

How do you find out what's available? These OTS publications are available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.:

U. S. Government Research Reports—a monthly which lists and abstracts all reports released during the month.

Technical Reports Newsletter—a monthly giving detailed reviews of new reports of special interest to medium and small size firms.

OTS also has compiled technical reports for many special areas such as transistors and adhesives. A list of the catalogs is available at no cost.

Liaison with Universities

Universities and industry are collaborating in special programs designed to help both parties keep tabs on our changing technology.

The Industrial Liaison Program of Massachusetts Institute of Technology is an excellent example. Formed in 1948 with a handful of firms, ILP now includes 89, reports V. A. Fulmer, director. MIT will realize over $1.2 million from it this year.

Industrial liaison programs have two objectives:

1. To aid industrial firms in keeping up to date on research in a wide range of fields.

2. To enhance the institution's educational activities through clearer associations with industry.

Success of your participation in such a program depends upon developing a close relationship with the university. Participating companies are invited to frequent conferences sponsored by MIT's Industrial Liaison Office. Some sessions are highly technical; some are aimed at presenting new developments to managers not familiar with them.

Copies of technical reports and other publications originating at MIT are mailed to participating companies.

ILP also arranges for MIT faculty members to visit participating companies for informal discussions with managers. Faculty members and company personnel agree that the basic benefit is the cross-fertilization which develops from discussion.

In addition, participants are in-

- A high speed, low cost coating of lead on steel that would be competitive with tin plate in fabricating nonfood containers.
- Products that will give the metal higher tensile and creep strength, better fatigue strength, and greater stress vibration.
- Greater penetration into ceramic and glass fields.
- Practical applications for the metal's heat and light emission characteristics.

COPPER TECHNOLOGY IS BOOSTED BY:

- Recently developed equipment that can roll sheets and strip to closer tolerances, more critical specifications.
- New offcenter copper tubing for electrical and induction heating applications—it replaces offcenter drilled bar stock and brazed bar and tube sections. The product reduces handling and scrap costs and improves electrical efficiency of inductor coils.
- A new salt bath for annealing and heat treating that reduces oxidation and gives smoother, brighter surfaces to mill products.
- Increased interest in spectroscopy as a faster and superior method of evaluating metals and ores.
- An additive for copper bath solutions that eliminates roughness, treeing, and modular buildup and produces a smooth, ductile, fine-grain deposit.
- A copper-zirconium alloy that is expected to find wide use in electrical equipment where there is a need for high electrical conductivity and good mechanical strength at high temperatures.
- Longer condenser and heat exchanger tubes that will allow designers to lengthen their equipment to gain advantages in construction, processing, and installation.
- Longer and heavier coils, longer tubes (coils, straight and bent), dual gage and duplex tubes, larger extrusions.
- Studies seeking methods to preserve the color of copper and its alloys.
- Improved surfaces in commercial materials to make them easier to use and less costly for the user.

TITANIUM DEVELOPMENTS ARE PACED BY:

- An alloy containing 0.1 per cent palladium that gives superior corrosion resistance in reducing or oxidizing acid environments.
- A liquid metal cooling system for melting titanium and other reactive metals to eliminate potential explosive hazards of water cooled systems.
- An electron beam melting process to produce high purity metal for highly specialized uses and to give noncontaminated welds which are more ductile than base metal.
- A beta titanium alloy that may provide burst pressures of 200,000 psi.
- A heat treated alloy that gives strength up to 185,000 psi.

ALUMINUM TECHNOLOGY'S GOAL:

- Prevention of stress corrosion.
- Wider selection of alloys.
- Improved methods of melting, casting, rolling, heat treating, and aging.
- Adoption of new testing methods, using improved nondestructive testing methods for alloys.
- Development of elevated temperature alloys for supersonic airframes.
- Production of high silicon, hypereutectic alloys for cylinder blocks and brake drums.
- Better adhesives to join aluminum with other materials.
- Continuous casting.
- New aluminum-magnesium alloys.
- Improved powder metallurgy techniques.
- More durable and economical anodic finishes that are easy to apply.
- Use of aluminum in clothing, rugs, furniture, wallpaper.
- New textures and greater contrasts in finishes.
- Sales of molten aluminum to plants located near a smelter.
- Chemical brightening of alloys.
- New uses for explosive metalworking.
- Adhesives that will maintain their strength at high temperatures.
- Welding aluminum plates ultrasonically.
- Markets for foamed aluminum.

vited to submit inquiries about technical problems to the Industrial Liaison Office when brief opinions or advice from faculty members is wanted.

Programs similar to that of MIT are conducted by other universities.

Keep an Eye Overseas

The impact of foreign competition in the domestic and overseas markets has added another dimension to the need to keep pace with technology.

Here again, the Commerce Department's Office of Technical Services offers a good starting point. Last year it established its Foreign Technical Information Center which collects and publishes translations of Russian, German, Japanese, and other foreign technical publications. Initial services included publication of abstracts appearing in 141 Soviet technical journals.

Many firms with overseas ties—licensing arrangements, subsidiaries, joint-ownership deals—have had technical information exchange pipelines. Most have been informal and hit and miss. Thoughtful metalworkers are warning that a well planned formal system is needed.

Foreign consultants, laboratories, and universities offer potential contacts. Some American research institutions are setting up foreign technical service groups.

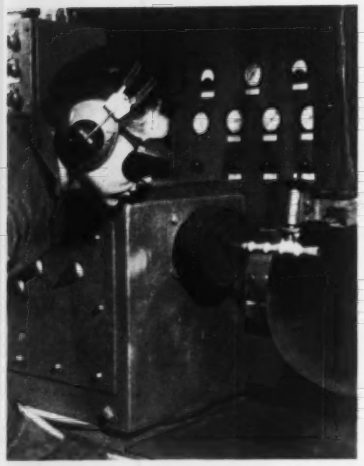
One such is Armour Research Foundation's European Technical Operations Group (ETOG). It has a four-man team operating in Europe to report scientific and technological developments to sponsoring American firms.

"Each of the men is a specialist with 20 or more years of industrial and research and development experience," relates Alexander Pupulidy, project co-ordinator. "All have advanced educational degrees and are at least trilingual."

ETOG puts emphasis on: Chemistry, chemical engineering, electrical engineering, metallurgy, and mechanical engineering. The three year old program has 19 noncompeting sponsors.

The European staff members spend most of their time attending seminars, conferences, trade shows, expositions, and technical meetings. Another important phase of the staff members' work: They also obtain ideas and information in other contacts with educators and industrialists.

"We emphasize that our Euro-



Plasma arcs make easy work of plating with difficult metals like tungsten

pean staff is not engaging in surreptitious activity," Mr. Pupulidy points out. "These men transmit only information that is freely available or given."

Sponsoring firms may also make special assignments to the ETOG staff. "Much of a sponsor's success in the program," officials relate, "depends upon the company official who maintains contact with the European staffman. We feel it takes about 10 hours per week of the company official's time to maintain proper correspondence — evaluating the weekly reports that come in, feeding ideas and new assignments back to ETOG." Because of the multiple sponsorship arrangement, costs are reasonable—$9000 for about 500 manhours of work per year.

Keeping pace with technology, admit most executives, is one of their most pressing problems.

The two biggest obstacles: "I just don't have the time."

"We can't afford the manpower and facilities that it would take to do a complete job."

But the effective manager is making the time. The aggressive company is finding the means to step up its program to keep pace. The reason: Michael Field, research director of Metcut Research Associates Inc., puts it succinctly: "If you rely only on experience, you'll be doing tomorrow's job with yesterday's technology."

Six Reasons Why Welding Is a Leader

KEEP close tab on welding—it's one of our fastest developing industries.

Surveys by STEEL editors turn up larger budgets and greater research and development efforts by equipment makers.

What to Watch for

J. J. Chyle, director of research and development, A. O. Smith Corp., Milwaukee, says that these techniques will get maximum attention from manufacturing managers in future improvement programs:

- **THE PLASMA ARC**

  A gas is ionized and superheated by an electric arc in a small, portable torch. The gas blasts past the nozzle at supersonic velocities. Temperatures run 5000 to 30,000° F. Applications: Vast potential for superfast cutting and welding with the same tool; plating or metallizing with superhard metals like tungsten, molybdenum, or refractories.

- **HIGH FREQUENCY RESISTANCE**

  Using induction heating power sources, machines are said to be able to join tin plate at 1000 feet per minute. Several pipemakers have already installed such equipment. A major feature: Heated zone is extremely narrow, an advantage in joining some of the heat treatable stainless steels.

- **ELECTROSLAG**

  A Russian development, just being introduced in this country, it speeds heavy welding and cuts the cost of large pressure vessels. (At least one U. S. firm—Arcos—has a machine to sell.) Applications are limited to structures with walls 2 to 12 in. thick.

- **ULTRASONIC WELDING**

  Special equipment uses vibration (sound waves) to join thin metals or foils. Advantages: Little or no heat and the joining of dissimilar metals. Promising applications: Foil packages to replace plastics and adhesive bonds, aircraft structures, electronics.

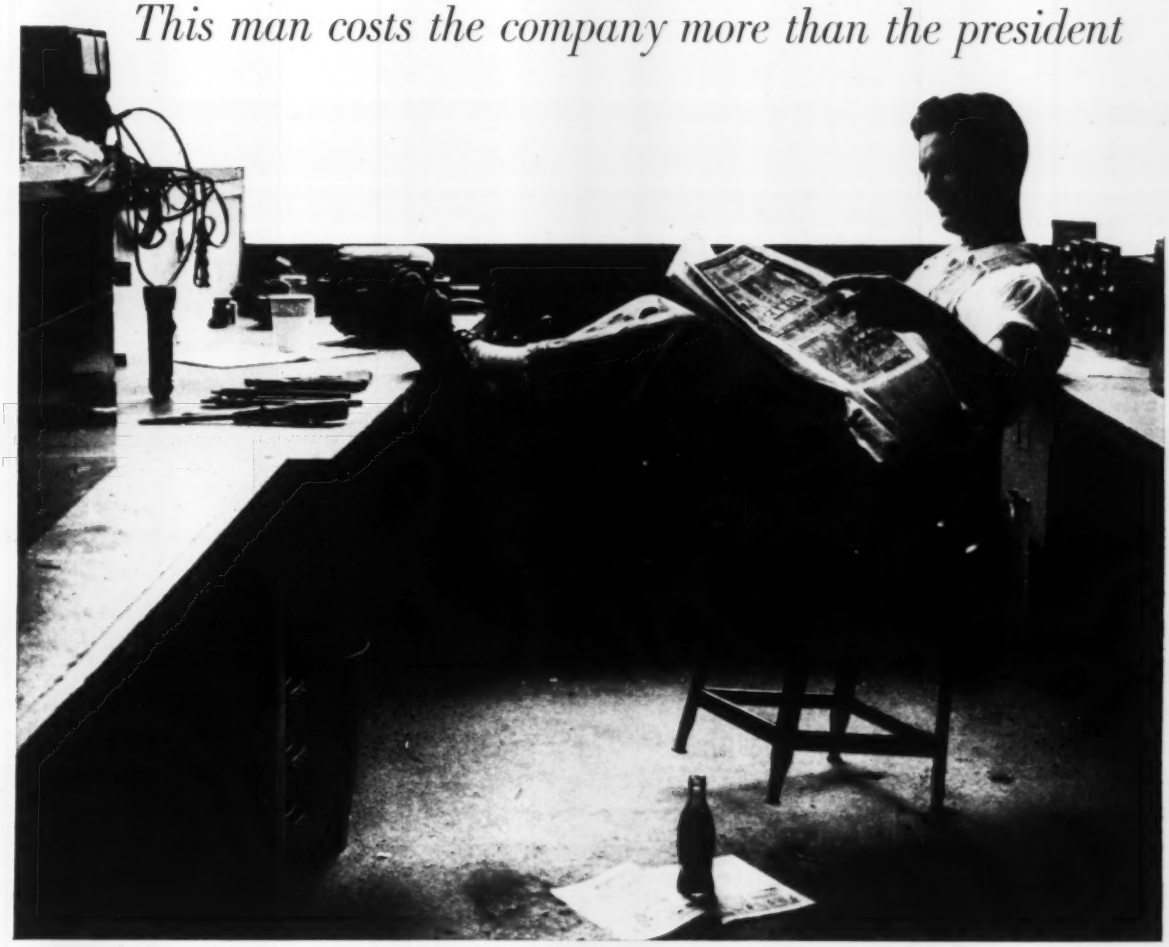
- **ELECTRON BEAM**

  Slamming a beam of electrons on a piece of metal in a high vacuum melts and fuses a joint. Advantages: Extremely high purity, deep penetration. Large structures will require big furnaces, but theoretically there are no limits. Increased use of reactive metals is expected to bring widespread use.

- **SEMIAUTOMATIC AND AUTOMATIC METHODS**

  This is the area getting most of the attention from the industry. Guidance systems have top priority. Future devices are going to require less and less skill from an operator while producing welds of increasing quality and reliability. Proponents of the newest semiautomatic systems claim that it takes only 30 minutes to train a raw recruit.

This man costs the company more than the president



At $800 a week, the company's top man is a real bargain. He works hard at the right things, gets a lot accomplished.

At $80 a week, this plant electrician (Sam's his name) is an extravagance – because he doesn't have *enough* to do.

Sam totes his tool box into a number of departments each day. Sometimes he finds work, sometimes he doesn't. When the reports come in (two weeks later), there's no sure way of telling whether he pulled his weight or not. He's chalked up to "overhead"... and a potential bit of profit gets lost in a catch-all figure. Year after year.

How to get your money's worth out of Sam? With Automatic Keysort punched-card controls. Keysort will give you a daily break-down of indirect labor (including maintenance) *by department*. Knowing the facts *on time*, you can keep costs on target by spotting wasted man-hours, pinning down undue fluctuations.

Automatic Keysort is today's only data processing system that provides a family of integrated machines and methods designed for the automatic creation and processing of original records. Speeding vital day-to-day and long-range facts essential to sound management, this unique system fits easily into your present operations... is highly flexible to future growth and expansion.

With the Automatic Keysort System, manufacturing concerns of every size can now enjoy fast, accurate data processing on either a centralized or decentralized basis. Without restrictive, complex procedures. Without specialized personnel. And at remarkably low cost.

Call your nearby Royal McBee Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. for illustrated brochure F-2. In Canada: The McBee Company Ltd., 179 Bartley Drive, Toronto 16.

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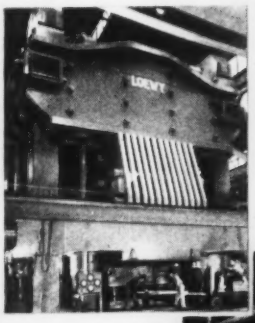
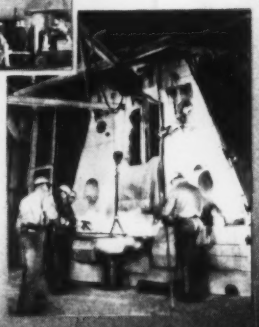
NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

Hands of the Giants

crack an egg or shape a missile

100,000,000 lbs. of pressure—so delicately controlled that it can be made to crack the shell of an egg. Use the fabulous forces of present day forging skills to crack the barriers of space—weight, strength, high temperatures. Forge the future, today.





EST. 1883

WYMAN-GORDON

FORGING

ALUMINUM MAGNESIUM STEEL TITANIUM BERYLLIUM MOLYBDENUM COLUMBIUM
AND OTHER UNCOMMON MATERIALS

WORCESTER, MASSACHUSETTS

HARVEY, ILLINOIS
DETROIT, MICHIGAN
GRAFTON, MASSACHUSETTS
FORT WORTH, TEXAS
FRANKLIN PARK, ILLINOIS
LOS ANGELES, CALIFORNIA

Technical Outlook

LEAD CEMENTED ALLOY—Mixing molten lead with finely divided particles of a metal or other material (like ceramics) produces a new material with the properties of both, says Battelle Memorial Institute, Columbus, Ohio. Six metals are particularly well suited for such combination: Cobalt, copper, iron, molybdenum, nickel, and tungsten.

'PAINT' RESISTS 2000° F— Firewalls in jet aircraft can be protected with a kind of paint made from stainless steel powder and sodium silicate. The dried film welds to the base metal at 1700° F and does not flow at 2000° F, says Philadelphia Quartz Co., Philadelphia.

BLOWN UP TUBING— The Soviets are making pipelines up to 10 in. in diameter from flat, hollow billets of aluminum. After rolling, the product (a long flat envelope) is coiled and shipped to the site. Injecting water swells it to size.

EASIER FREIGHT RIDE— An experimentally cushioned underframe for freight cars being tested by Pullman-Standard Div., Pullman Inc., Chicago, is expected to cut substantial amounts from the $100 million annual damage to lading.

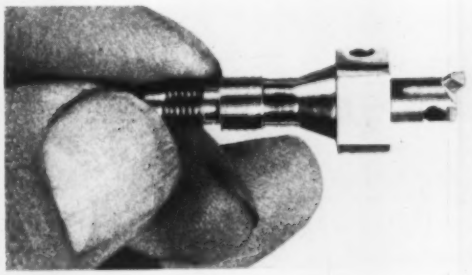
OUTSIZE PLASTIC DIE— A west coast firm reports having built a stretching and shaping die 7 ft high and 13 ft long. The material: Epoxy laminated facing on a cast epoxy base.

NUCLEAR POWER FOR 'COPTERS—Feasibility studies of a giant nuclear powered helicopter are in the hands of Army staff people, says Bell Helicopter Corp., a subsidiary of Bell Aircraft Corp., Ft. Worth, Tex.

STOCKRAY FOR STACKS—Nuclear radiation gages indicate blast furnace burden level in a system developed in the Electromechanical Research Center of Republic Steel Corp., Cleveland. Called Stockray, the system is used instead of the conventional stockline in the company's furnace at Chicago.

BUSINESS OPPORTUNITY—Small firms that want government research and development work may tell the Small Business Administration about their qualifications by writing before July 17. (Ask for Form 449.)

PORCELAIN ENAMEL GUIDE—Defects in porcelain on steel are covered in a volume (PB 151053) just out. You can get it from OTS, Department of Commerce, Washington, D. C. ($2.75).



MINIATURE BORING TOOLS like this one are used by the hundreds at Eclipse Pioneer Div., Bendix Aviation Corp., Teterboro, N. J. Used to bore holes in instrument mounting plates, the cutters are turned out on automatic screw machines by Eclipse operators. The stub end, at right, fits in a hole that's 0.0015 in. off center, giving a 0.003 in. adjustment in hole size just by rotating the stub bar

FASTER PHONE CALLS—A new telephone switchboard has no contacts or moving parts, switches calls almost instantly, says IT&T, New York. It took a French firm ten years to develop. American applications are already on the way.

Metalworking Outlook—Page 43 Market Outlook—Page 137

How to Maintain and Certify Heat Treat Furnace Controls

New methods and equipment developed by an aircraft company enable technicians to clean, overhaul, and calibrate control instruments without disrupting production

By R. M. LADY
and
R. G. MATTHEWS
Lockheed Aircraft Corp.
Marietta, Ga.

With this portable test cart, a furnace temperature uniformity survey can be run in minutes. Range changing cards like the one the technician is holding change the center scale value of the recorder

MAINTAINING accurate control of heat treating equipment doesn't have to be a cumbersome, time consuming chore. It can be an economical, highly effective, and efficient routine.

New methods for calibrating and maintaining the instruments that control critical heat treat temperatures have been worked out by the Georgia Div. of Lockheed Aircraft Corp., Marietta, Ga. The new system has cut operating costs, improved product quality, and practically eliminated furnace downtime caused by instrument maintenance.

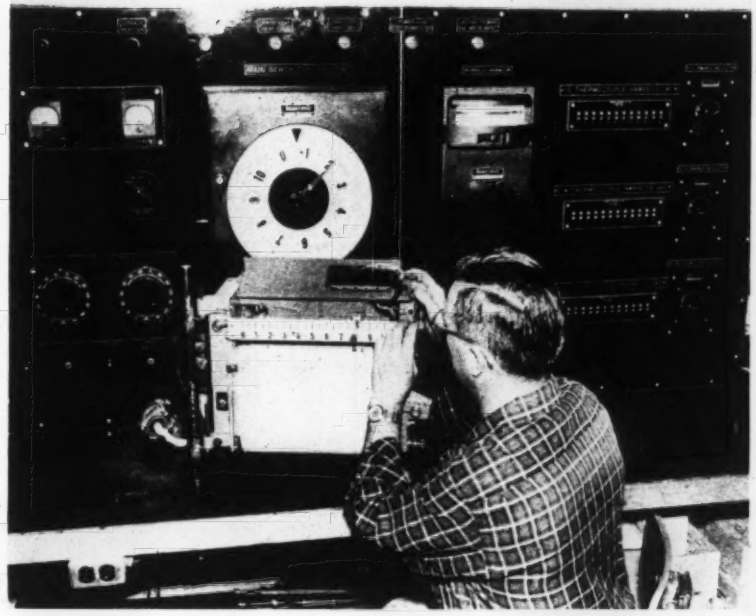
• The first step in revamping maintenance was to substitute functionally tested spare instruments for those that were to be overhauled.

Under the old system, each furnace had to be shut down periodically while its control instruments were being overhauled, cleaned, and recalibrated. That posed difficulties for the production departments which were required to maintain schedules with less equipment.

To institute the new system, the authors devised a quick-connect plan making use of Cannon plugs and receptacles. All complex instruments were rewired to conform to the quick-connect plan.

Since 12 wiring plans are used in the different control instruments, interpin jumpers were installed in cable plugs to identify the wiring plan for each instrument.

When an instrument needs cleaning and overhaul, it is necessary



This bench can functionally test all heat treating instruments, amplifiers, and control units. Relays behind the panel automatically connect the proper test circuit to match the unit

only to unplug it and plug in a functionally tested spare. The furnace is back in operation in minutes.

• The next step was to equip the laboratory to overhaul, test, and calibrate instruments as quickly, precisely, and efficiently as possible.

Instruments were being serviced at the furnace. Full laboratory facilities weren't available. A worn part necessitated a long trip to the laboratory for a spare, adding further to maintenance cost and downtime.

The authors designed a furnace control test bench that would functionally check all control instruments, amplifiers, and Electr-O-Pulse (electric time-proportioning control with automatic reset) units.

The instrument to be checked is plugged into a Cannon receptacle on the test panel. With the help of the identifying interpin jumpers on the cable plug, the bench automatically rewires itself to match the instrument under test. That arrangement does away with manual hookups or complex switching systems, conserving time and eliminating human error.

The unit under test becomes an integral part of a working system and can be operated while on the workbench. Troubleshooting of malfunctioning units can be handled easily since the unit is wired for all its normal field functions and is exposed for easy access.

• To reduce the time required to make furnace temperature uniformity checks, the authors designed two portable survey test carts which were built at Lockheed around two Brown ElectroniK multiple record potentiometers.

The instruments were modified to function as 12-point recorders, with expanded readout (narrow span), giving a full scale response to a 5-millivolt signal.

Two 12-point carts are used rather than a single 24-point one to allow use of one cart while the other is being recalibrated. Both carts are used to make surveys of the large furnaces.

Both recorders have plug-in type range changing cards that give center scale values of 250, 350, 375, 650, 920, and 1600° F. Those are the temperatures at which the various heat treating furnaces are checked. Additional cards for other center scale values can be made.

A reference junction ice bath is built into the cart to eliminate the need for ambient temperature compensation. Since tolerances can be read directly from the instrument charts, there's no need for mathematical calculations.

To make a uniformity survey, a technician rolls the test cart up to the furnace and plugs it into the nearest 115 volt utility outlet. He inserts special lightweight probes into holes in the furnace and plugs extension wires from the probes to a jack panel on the cart.

He turns on the instrument and in 2½ minutes has individual readings from each of the 12 probes. A glance at the chart tells him whether any of the readings fall outside the upper and lower tolerance limits. The chart section is identified and retained as a permanent record.

Under the old method, it was necessary to shut the furnace down while a technician with a single probe made successive tests by inserting it into holes in the side and top of the furnace. Another technician, using an indicating potentiometer, recorded millivolt readings, each time compensating for variations in ambient temperature.

Time was lost in moving the probe from hole to hole. After all readings were taken, they had to be converted to temperature mathematically.

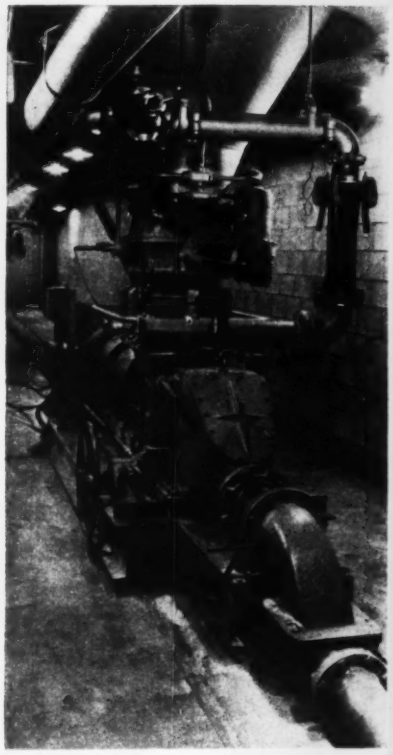
The new method insures an ideal uniformity survey with virtually simultaneous reading and recording of temperatures at all required points. Moreover, the true picture of heat distribution throughout the furnace is made in minutes, rather than hours, and without disturbing production schedules.

Those three steps are parts of a master plan at Lockheed for improving heat treat quality and lowering maintenance costs. Other improvements include written procedures on each furnace to guide the instrument technicians, periodic scheduling of all work involved, training of personnel, weeding out of obsolete equipment, and procurement of new equipment needed to maintain high quality work standards.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Pneumatic Conveyors Solve Sticky Problem in Taconite Processing

Pneumatic unloader empties 100,000 lb of soda ash from railroad car. Connecting the hose is the only labor involved in this operation. A suction-type Airveyor system is used to handle the soda ash because it bunches up and sticks



Portable pump, on track, beneath outside bentonite storage silos conveys materials to process bins

A "BELT" of air can often solve a sticky material handling problem, particularly if the material is a hygroscopic chemical like bentonite or soda ash which becomes "sticky" when exposed to humid air.

At a large taconite pelletizing plant in the Mesabi Range, pneumatic systems have overcome difficulties in handling those additives and pulverized coal as well.

• Four separate pneumatic systems are controlled by one man at a giant panel.

The systems are used for conveying the various taconite additives —starting with their arrival at the plant, to storage, then from storage to process. Flow lights on the control panel indicate the path each material is taking at every moment. A complex system of interlocks on the panel prevents any operational mishap.

All the pneumatic conveying equipment, including the control panel, at the pelletizing plant was engineered and manufactured by Fuller Co., Catasauqua, Pa.

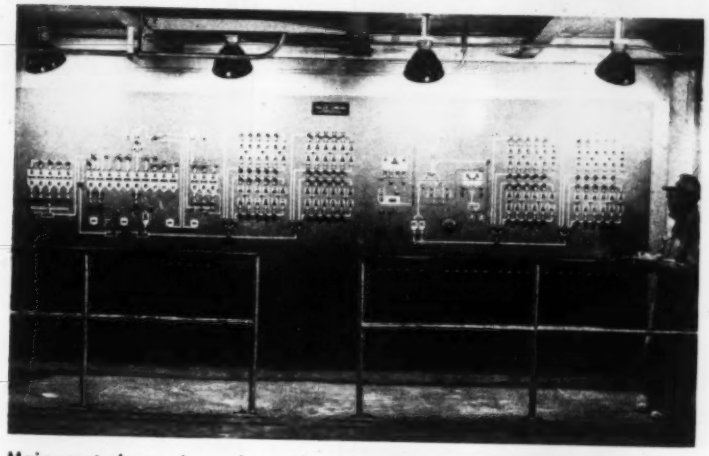
• Bentonite and soda ash arrive in weather-sealed Airslide cars.

There are two unloading stations. One serves a Fuller-Kinyon system for transferring bentonite to outside or in-plant silos; the other is part of an Airveyor system for handling soda ash.

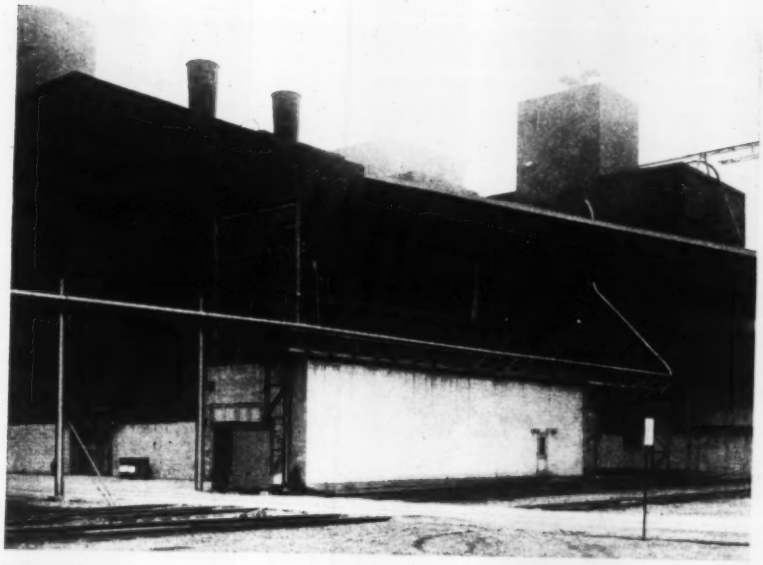
When a car containing 140,000 lb of bentonite pulls up at the first unloading spot, an underground chute is opened and a flexible car connection attached. The material discharges into a 30 ft long Airslide fluidizing conveyor which feeds directly into the hopper of a Fuller-Kinyon pump.

The Airslide conveyor is designed to handle finely powdered material.

The finely powdered additives used in pelletizing of the magnetically separated ore can be moved easily when suspended on a belt of low pressure air



Main control panel regulates the unloading, storing, and transfer of all additives used in processing iron ore pellets from taconite ore



Fuller-Kinyon line stretches from bentonite silos and snakes up side of additive building, delivering bentonite to the process bins

It floats the powdered bentonite on a "belt" of low pressure air. The conveying duct consists of parallel upper and lower chambers separated by an air-permeable diaphragm. Air under low pressure, which is passed from the lower chamber through the diaphragm, partially fluidizes the bentonite and gives it the characteristics of a liquid. Result: It flows by gravity to the pump hopper.

Bentonite advances through the barrel of the pump where it is compacted by a decreasing pitch of the impeller screw flights and a variable space provided between the last flight and a check valve.

The material then enters a mixing chamber where it is fluidized by compressed air introduced through a series of jets. In the fluid state, it is advanced through the pipeline at a capacity of 35 tons an hour for up to 600 ft to one of three outside silos.

A special branch line makes it possible for the bentonite to be transferred directly to one of two silos in the additive building. The motorized diverting valve is controlled from the central panel. Metering devices linked to the panel help it do much of the "thinking" required. Flow of incoming material from one bin to the next occurs automatically when a Fuller high-level indicator is tripped.

• Cars loaded with 100,000 to 110,000 lb of soda ash are spotted at the second unloading station.

An operator connects a conveying line to the car outlet, and the soda ash is unloaded into two outside storage silos. A suction-type Airveyor system is used to handle the material because it has a tendency to pack and bunch up, causing it to stick.

A second Airveyor system is centered in the additive building, above the collection of process bins. This system can be used to unload directly from the incoming cars and also reclaims from the outside storage silos. Suction is provided by an exhauster made by Sutorbilt Corp., Compton, Calif.

To reclaim bentonite from outside storage silos to process bins in the additive building, a pumping system is used. In an enclosed passageway beneath the silos, a portable Fuller-Kinyon pump rides on a track. Easily connected to the discharge spouts of the three overhead silos, it pumps the bentonite directly to one of two process bins at up to 1600 lb a minute.

• The purpose of the additives is to agglomerate, or pelletize, the iron ore which is extracted from the taconite and pulverized to the point where it would blow away if left exposed in open cars or stockpiles.

Bentonite acts as the binder to

give it body. Soda ash aids in dispersion of the bentonite.

In pelletizing, the additives are first blended and metered to a paddle mixer. From the mixer, they enter another Fuller-Kinyon conveying system for delivery to one of 24 service feed bins in the pelletizing plant.

The blend is mixed with the ore concentrates and coal. The mixture is rolled into small balls in huge, declining, rotating drums. The balled mixture (iron ore, coal, and additives) is fired at 2400° F in shaft furnaces to produce a hard, dense pellet suitable to stand the rigors of shipment to steel plants.

• The fine anthracite coal is brought by conveyor belt to a grinding circuit and then dried.

From the dryer, it is introduced into one of two tanks of a No. 185 Dual Tank Fuller-Fluxo conveying system inside the additive building. In this system, the tank feed cutoff valve closes automatically when the blow-tank vessel has received a full charge of material.

A predetermined timing cycle permits air to enter the vessel at the proper time through an aeration ring near the vessel line and an air valve at the bottom of the cone. The combined air released into the vessel builds up sufficient pressure to eject the feed into and through the conveying line to destination.

The destination, 24 furnace feed bins, are up to 600 ft away. Coal is conveyed to them at about 30 tons an hour. Again, a system of high level bin indicators and motorized diverting valves sending information back to the main panel automatically controls the entire operation.

• Taconite starts out as a flint-hard rock assaying about 30 per cent iron.

It's blasted out of the ground, then ground and crushed until it reaches kitchen-flour fineness. Magnetic separators remove the high iron content portion of the ore.

After pelletizing and firing, the taconite is once again as hard as rock, but it is high grade iron ore.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Costly Aluminum Plates Reclaimed by Belt Grinder

AN EASTERN manufacturer is saving several hundred dollars monthly by resurfacing aluminum sheets with a coated abrasive belt.

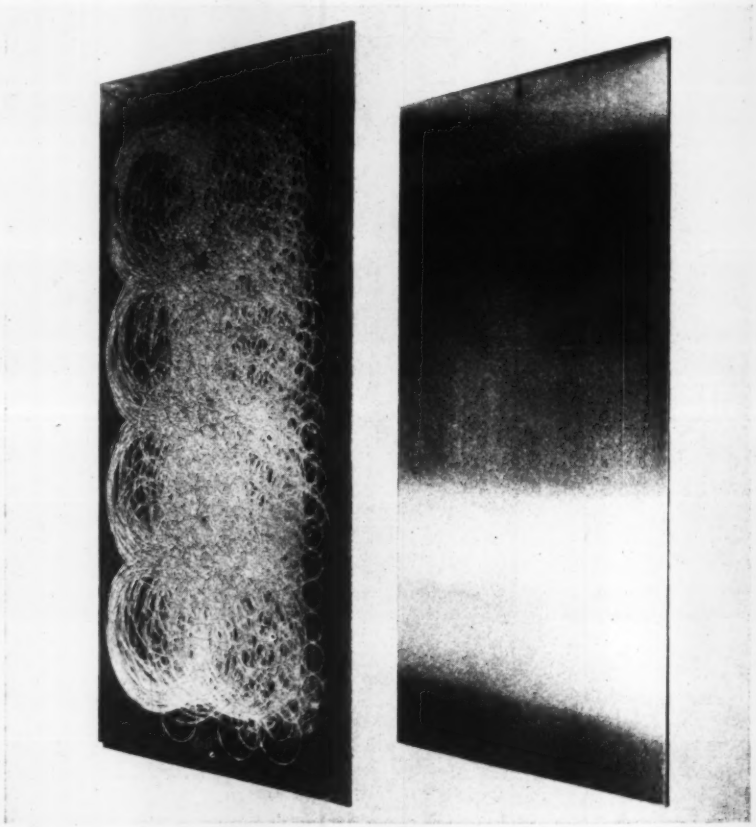
The 22 x 40 x 1/4 in. sheets are used as die backup plates in punching out discs of a fibrous material. The plates are shifted frequently to provide an unmarred surface for the die, but eventually the entire surface becomes deeply scored, making the plate useless.

The manufacturer tried to resurface them by planing or milling, followed by surface grinding, but the job was so costly that it proved cheaper to scrap the plates.

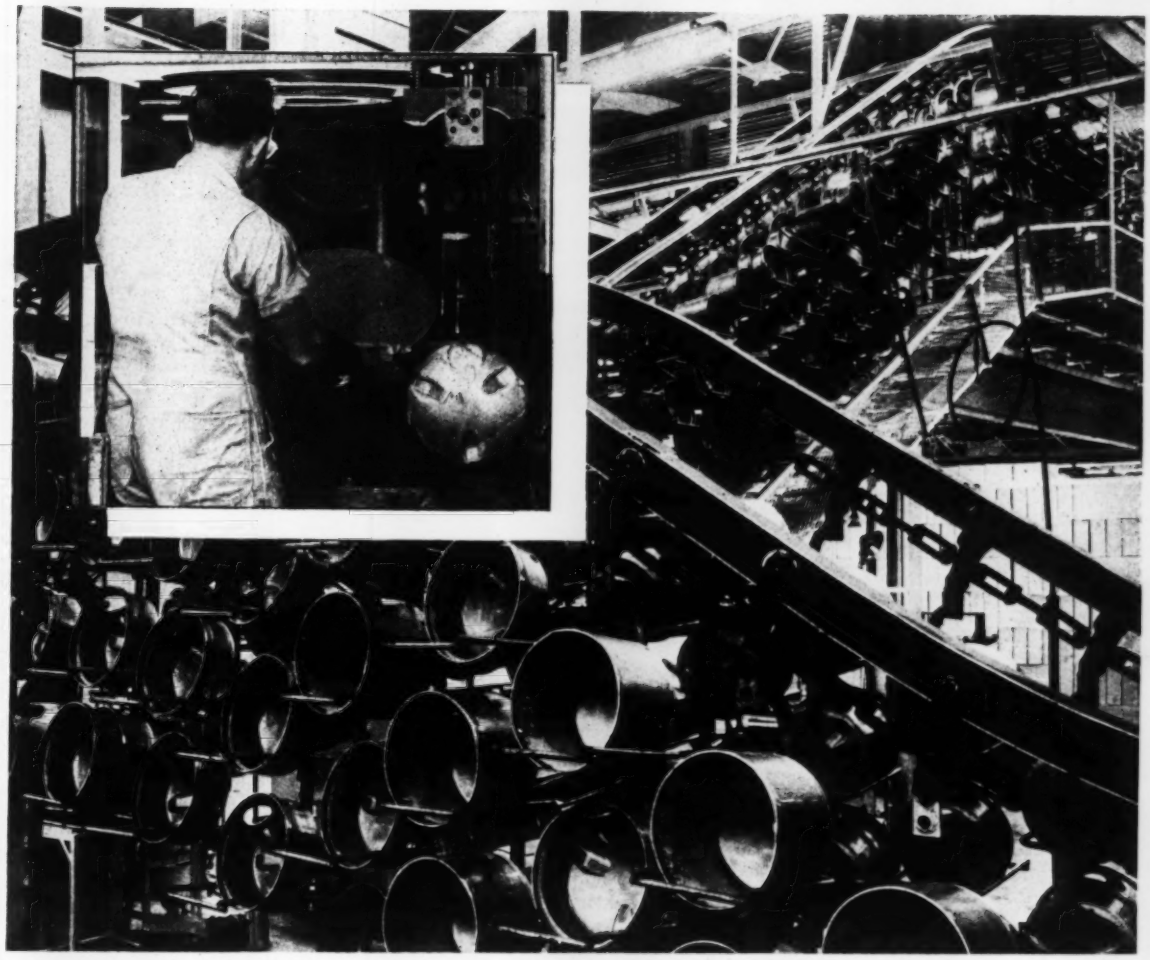
• A Behr-Manning Co. product engineer was asked to help and recommended belt grinding.

The sheets are supported on Masonite and run through a pinch roll grinder against an X-weight cloth belt to which 36 grit silicon carbide abrasive is bonded with resin over glue. The belt is run over a 65 Durometer contact roll with 35 degree serrations 1/4 in. wide and lands 1/4 in. wide. Belt speed is 3900 sfpm; feed speed is 30 fpm.

The roughing operation is followed by two passes with a 120 grit aluminum oxide closed coat paper belt of E weight, sprayed lightly with mineral oil. The finish is equal to that of the original, and the operation is proving far cheaper than the sequence of milling or planing plus surface grinding.



Belt grinding of deeply marred aluminum sheets restores original finish



The press is forming the lower air conditioner compressor shell. The operator feeds blanks into the die and places formed shells on the side punch. A side hole is punched at same time another shell is formed

These Steel Shells Are Made in a Single Draw

Advantages: Forming operations can be reduced, and press-work that couldn't be done before may be possible. Significance: More parts in less time

IF a deep drawing operation is slowing down your production, a southwest manufacturer of air conditioning units may have a tip for you.

The firm is stamping out steel shells for compressor units at a rate of 100 in 64 minutes. Drawn from a 22¾ in. diameter blank of 0.1644 in. drawing quality steel, the finished shells are 11.35 in. in diameter and 11 in. deep. All dimensions are held to specifications, and the stampings are smooth and uniform.

• **Key to the operation is a 400 ton, Steelweld Speed-Draw press made by Cleveland Crane & Engineering Co., Wickliffe, Ohio.**

The mechanically operated machine can make extra deep draws at higher speeds than shallow ones can be made on a standard crank type press, says the builder. The deep draw feature frequently reduces the number of operations required to form a part and often permits operations that are not possible with other types of presses.

• **Shells, made in two sizes, are later joined to make housings.**

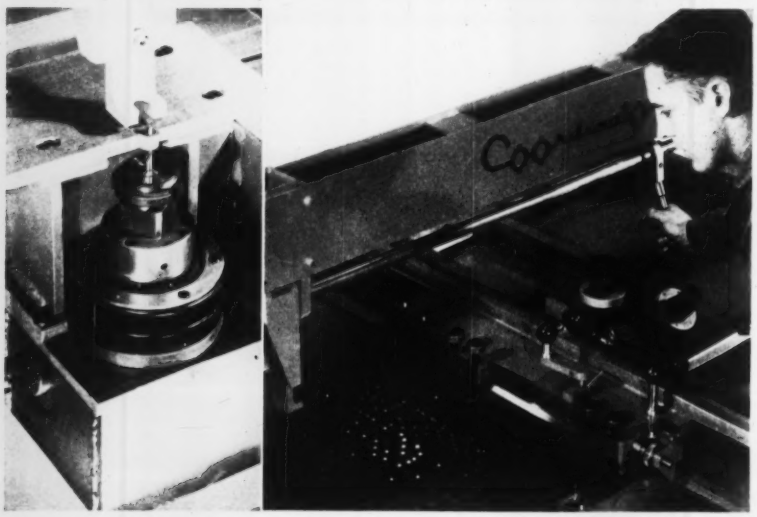
The upper or longer shell is drawn through die rings and ejected from the dies onto a conveyor below the machine. The lower, shorter shell is removed from the die by the operator and placed onto a tool at the right front of the press which punches a hole in the side.

This operator, guided by a color coded template, puts up to 100 holes a minute in sheet materials. Here he fires a stylus into a template hole, simultaneously firing the punch into the workpiece

System Offers Shortcut For Short Run Piercing

It combines template controlled operation with economical template making. Some lots can be completed in time normally spent on tooling layout

This operator has aligned a template blank in the Co-ordinator by using the two optical scanners. Now he's feeding a drill up through a carbide guide bushing (at left) into the template. Hole location is held to ±0.002 in. Manual layout is eliminated



TEMPLATE-guided production of punched sheet metal parts got a boost when Wiedemann Machine Co. announced its Templamation concept. It carries the process from the blueprint to a finished part.

The long time builder of template controlled turret punch presses has been concerned about the economy (or lack of it) in generating the templates that guide its machines. To speed up this job, the company equipped many of its presses with co-ordinate scales so the operator can punch the templates on the production machine.

But the system has a major drawback. It takes a relatively costly machine, worth, say $20,000, out of part production. For this reason alone, some users have preferred to turn out templates by the sometimes-tedious system of hand layout, then jig boring.

• **Short Run Speedup**—With the addition of a templatemaker and an inspection machine to their line, Wiedemann engineers have made it possible to make a template and turn out a short lot of parts, say 25, in the time it ordinarily might take just to turn out a template.

The templatemaking machine, called the Co-ordinator, makes it possible for a semiskilled operator to locate and drill holes at the rate of 100 or more an hour, with hole locations held to ±0.002 in.

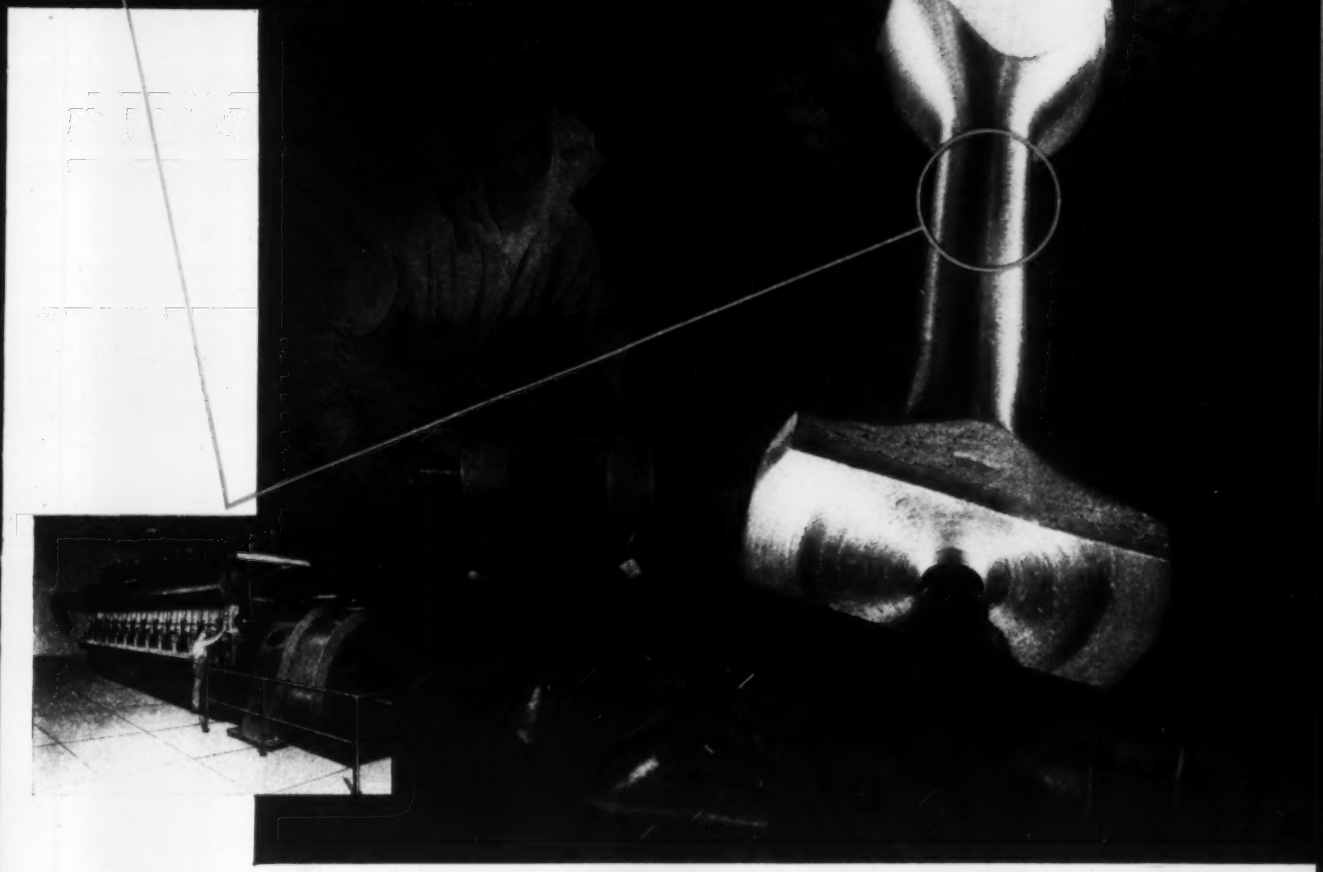
First, he puts a template blank of up to 36 by 42 in. on the cross slide. He positions it to X and Y center line dimensions for each hole with precision optical scanners and graduated scales. When each location is set, a drill moves up through a carbide guide bushing to put the hole in the template.

Costing about a third as much as the turret press, the Co-ordinator permits the user to keep his production machine at work.

The third member of the Templamation team is an inspection machine that lets the operator read hole dimensions optically from decimally graduated scales. The dimensions can be read in 0.0005 in. increments at the rate of one to three holes a minute.

In a test setup at the Wiedemann plant, King of Prussia, Pa., a template was produced, inspected, and some parts run off in the time it ordinarily takes to lay out a template.

1500 lbs. of Forged Steel Power Transmission



This 1500 lb. forged steel diesel engine connecting rod is taking a "dressing down". At working weight (1400 lbs.) it will transmit horse power in a municipal power plant. Another photographic example of the diverse sizes and weights of component parts going through our forge shops daily. You are assured of the same engineering and metallurgical quality control, the same careful craftsmanship which characterize steel forgings weighing 80 tons and more, when you place with us the responsibility for making any size forged steel component part.

Regardless of the size or weight of steel forgings or castings you require, it will pay you to consult with us.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

Getting More Work From Your Computers

The same electronic instruments can often be used in several applications. They'll furnish information on earnings, equipment capacities and delays, and machine or mill programs faster than other methods—and they're more accurate. Corrections and revisions can be made in a fraction of the time required by clerical methods

THE PURCHASE of computing and tabulating equipment is often justified by time and money savings in one application. The challenge is to find other uses which will spread the benefits of the technique.

Electronic computers are used efficiently in a system developed by industrial engineers at the Aliquippa, Pa., Works, Jones & Laughlin Steel Corp. They do a large volume of routine calculations, freeing engineering and clerical personnel for other work.

• Cycle times are calculated for the company's 44 in., hot strip mill and equipment used with it.

Computer programs have been developed for the reversing-roughing mill and the finishing mill. They allow for mill horsepower or speed limitations and insure smooth flow of material from heating furnaces.

Decks of punched cards containing programing instructions are fed into the computer in sequence. Other cards, bearing essential processing limitations, such as pass speed or slab thickness, are also inserted. Another deck, containing charged and finished size combinations, is fed into the computer.

The machine draws necessary calculations from a memory storage system and computes the charge-finish combinations, one at a time. It produces a punched answer card for each combination and repeats the computing cycle until all punched cards are processed. It completes a calculation in 11 seconds vs. 56 minutes by previous methods.

• More than 6700 product combinations are involved in operating the mill. Production bottlenecks could be caused by improper correlation.

Slabs entering the mill are 5 to 7½ in. thick, and 8½ to 40 in. wide. They're 88 to 282 in. long. Strip leaving the finishing mill is 0.047 to 0.375 in. thick.

Carbon steel slabs up to 6¾ in. thick are processed in five passes on the reversing rougher. Thicker ones require seven passes. Slabs to be made into beveled edge products are processed in three, five, or seven passes.

Other factors that affect cycle time: The number of coilers in operation, the number of heating furnaces used, and how slabs are delivered (from the heating furnace or the blooming mill).

• Production delays are tabulated faster with electronic equipment.

Delay time data for each shift are recorded on punched cards. Delays are classified as to type—mechanical, electrical, operating, or other—and the elapsed time for each is recorded. The cards are fed into a machine that prints the data and shows the total delay time for the shift.

The number of delays of a certain type, the time for each delay, and total time lost in a particular month are available to the industrial engineer. Example: A sorting machine selects punched cards on which mechanical delays are recorded; the printing machine then prints and totals information from mechanical delay columns on the cards.

• Tabulating and computing equipment are used in developing and following up employee incentive plans.

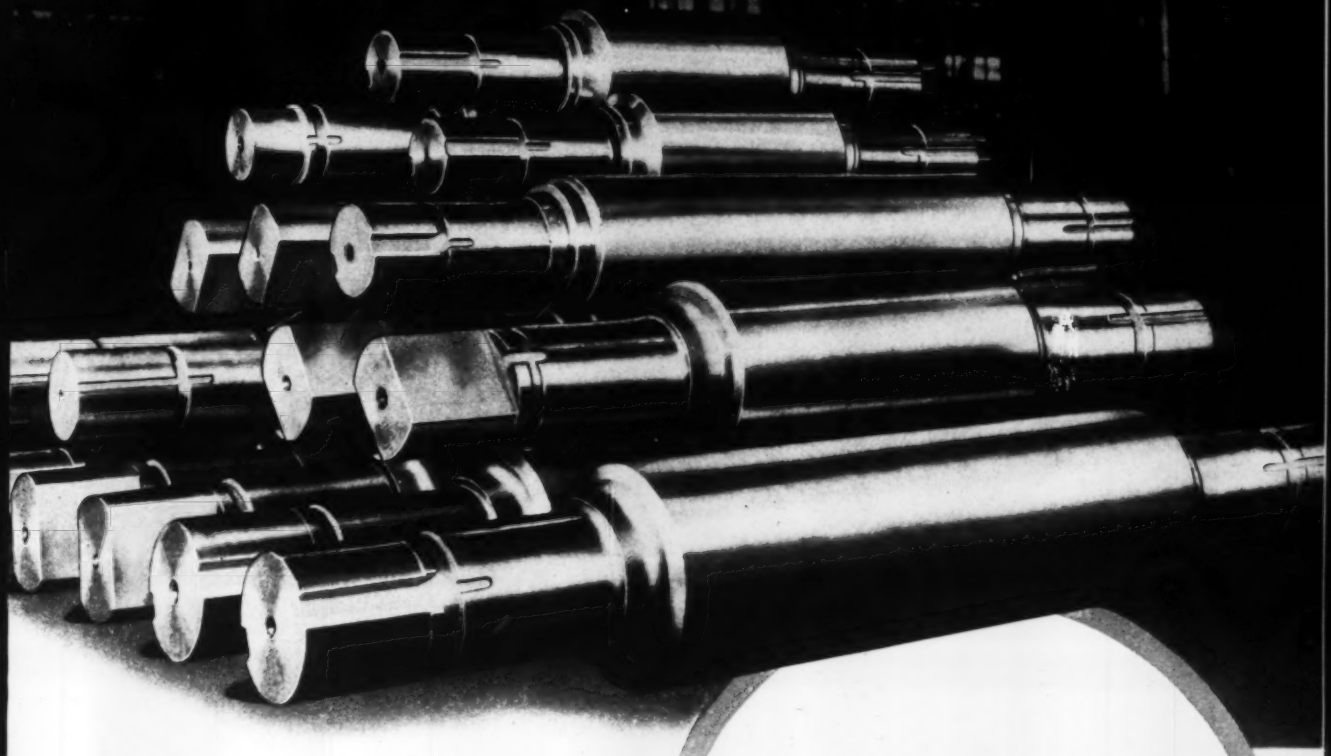
In the follow-up work, average performance is calculated for each pay period for 86 incentive plans used by producing units. For some units, the calculations are made on a weekly or monthly basis.

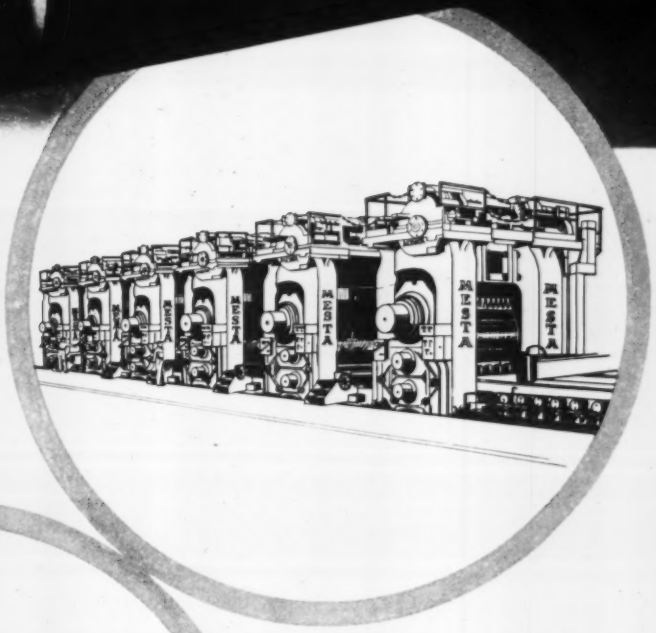
One clerk, using tabulators and computers, can handle all the calculations. Reports contain enough information to make retyping unnecessary. Previously, follow-up required the services of two full time clerks; often, a third was needed.

Here's What Computers Do At Jones & Laughlin's Aliquippa Plant

- **Production Delay Analysis.**
- **Employee Incentive Plan Development.**
- **Employee Performance Studies.**
- **Calculation of Strip Mill Cycle Times.**

MESTA ROLLS





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PITTSBURGH, PENNSYLVANIA

Dolomite Thrower Takes on New Job

Self-propelled dolomite machine throws sand through the open door of a billet reheat furnace, reinforcing thin spots in the furnace bottom

Machine delivers 1200 lb of sand per minute and simplifies bottom making in billet reheat furnaces. It will pay for itself in time saved over hand shoveling

SPECIAL machines don't always lack versatility.

A mobile dolomite throwing machine dispenses silica sand to make bottoms in eight billet reheat furnaces at the Ambridge, Pa., plant of A. M. Byers Co. Developed by Blaw-Knox Co., Pittsburgh, it has increased the efficiency of the operation at least 50 per cent.

• The self-propelled machine is mounted on rubber tires.

It will pay for itself in four months in time saved over hand shoveling methods, the company says. The machine throws sand into the furnaces at 1200 lb per minute.

Sand flows from the 120 cu ft bin to a feed hopper. A grooved throwing wheel carries it to a high speed, rubber covered belt, which sends it into the furnace in a compact stream. Diesel driven, vane type pumps furnish hydraulic power for the throwing mechanism.

• Furnace bottoms are inspected and repaired every 8 hours.

Once every shift, the unit is moved into place in front of the furnace. The heater inspects the furnace bottom and directs a stream of sand to reinforce thin spots.

The stream is controlled by adjusting the speed of the hydraulic motor. An operating handle allows the stream to be moved vertically or to either side.

The bin gate can be adjusted to regulate the flow of sand to the throwing mechanism.

• Billets are heated in the furnaces before they're rolled in a merchant mill.

The furnaces handle 10 tons of wrought iron billets per hour. The billets, 3¾ to 4¾ in. square and 4 ft long, lie on a 4 in. bed of sand on the furnace bottom.

After they're heated to about 2500° F, billets are rolled into round or square bars, or into skelp, which is later made into buttweld or lapweld tubing at the company's Pittsburgh plant.

New Punches, Retainers Trim Die Cost, Downtime

Removable type punches and retainers that require no built-in devices to hold the punch have been developed by Pivot Punch & Die Corp., North Tonawanda, N. Y.

• **Costs Less**—It's priced about 20 per cent below the average head type punch, says the company.

One reason: The retainer (called Cone Lock) doesn't require hardening. It's made from a tough machinable alloy (35 to 40 Rockwell C). Changes can be easily made if additional holes are required.

Pivot Punch & Die says the design of the punch used in the Cone Lock retainer offers as much strength and holding power as a head or shoulder type. The angular bearing surface of the punch goes completely around the periphery of the head section.

Die construction of this type makes it economical to convert shoulder punches to removable punches, says the company.

• **Less Downtime**—Punch dulling causes close to 80 per cent of all press downtime. When removable punches are used, dull punches are simply pulled out and replaced while the die is in the press.

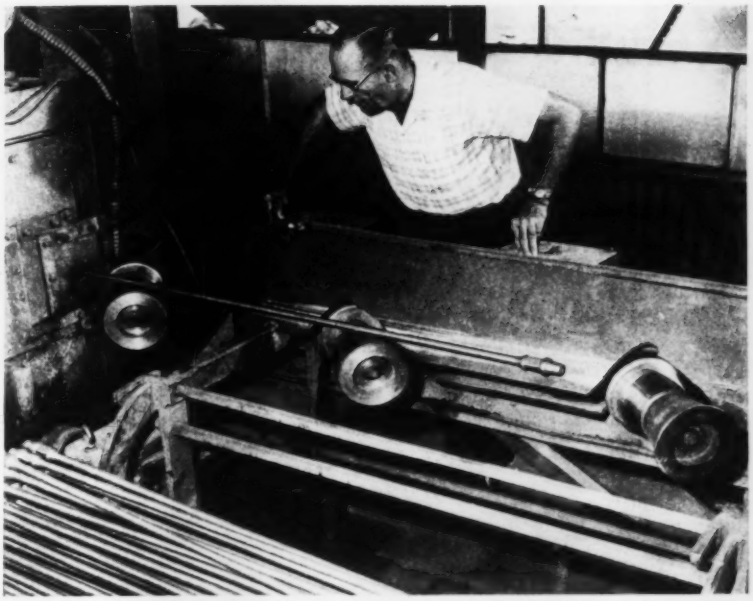
The punch retainer is made by countersinking each hole that retains a punch. The retainer is seated in the countersunk area to provide the holding mechanism.

A hardened backup plate is then mounted between the retainer and the die shoe. The punch is pushed in and can be removed by simply turning while pulling downward.

X-Rays Gage Tin Plate

Gages that give continuous quality control on tin plate lines are announced by the Instruments Div., Philips Electronics Inc., Mt. Vernon, N. Y.

One x-ray tube is mounted above the moving strip, the other below it, just before the oiler. Beams hit the strip at an angle, penetrating the tin coat and causing secondary radiation in the steel. Intensity of secondary rays passing through the tin to a detector indicate coat thickness.



Well rods emerge from the blast cleaning machine at 125 fpm. Only one operator is needed to feed the rods and remove them from powered rolls into cradles which hold about 150 pieces

Descaler Improves Quality Of Forged Well Rods

CONTINUOUS descaling has practically eliminated defective oil well sucker rods for the Continental-Emco Div., Youngstown Sheet & Tube Co., Garland, Tex.

It also replaced manual air blasting of rod ends which was a production bottleneck, says A. L. Long, plant superintendent. The clean surface of descaled rods also makes it easier to pick out flaws.

• **Rods are made from raw bar stock.**

After straightening, each end is forged so the rods can be connected when being placed in a well. Forging is followed by normalizing, tempering, and drawing. Rods are painted and stored after cleaning.

The blast cleaning machine, made by Pangborn Corp., Hagerstown, Md., handles 25 ft rods at speeds up to 125 fpm in one pass. Two wheels mounted in line throw more than 29 tons of steel shot per hour. A set of powered rolls rotates the rods exposing all surfaces to the blast action.

Only one operator is needed to flip the rods from the loading cradle to the feeder. Clean rods are guided off rollers into cradle units where they are gathered into bundles of 150.

• **Conveyor rolls, end liners, and bearing shields are made of a wear resistant P-41 alloy which has a service life of four years.**

Regular steel parts last six or eight weeks.

A separator removes worn particles and contaminants while the machine operates. Spent abrasive falls into a hopper which automatically separates usable pieces from scale and refuse and returns good material to the hopper. Scale and debris drop into a receptacle while dust passes through to an outdoor dust collector.

Welding Builds a Better Coffeepot

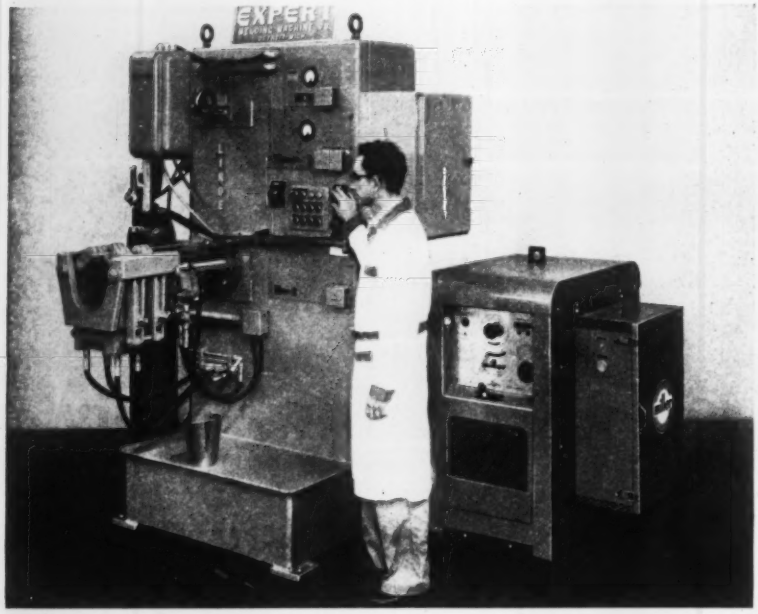
THE MAKER of a coffeepot needed an inexpensive way to join the side and bottom of the stainless shell.

The answer: Automatic Heliarc welding. Joints are so good practically no finishing is needed. Production runs about 2000 coffeemakers per day; rejects are less than 1 per cent; and costs are said to be far less than those of a comparable deep drawn design.

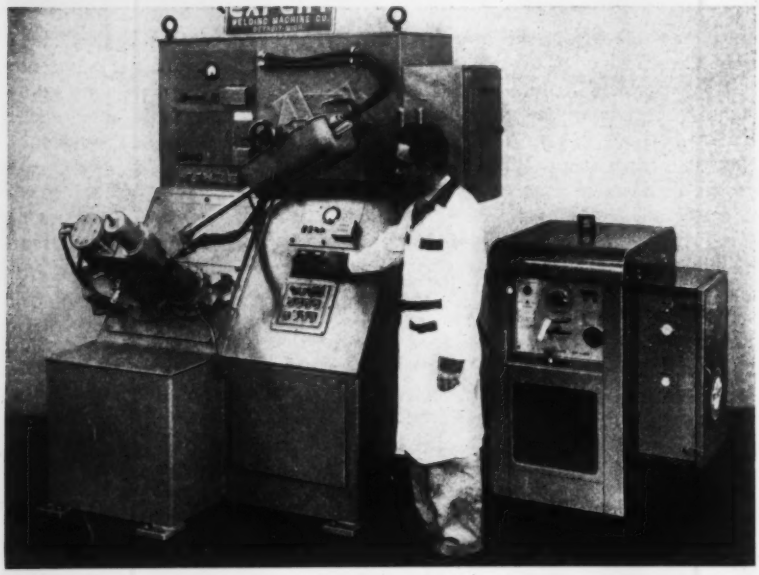
• The machines are the first of a series which will rely on great precision.

Expert Die & Tool Co. Inc., Detroit, designed them around a concept developed by Linde Co., a division of Union Carbide Corp., New York. Linde believes that machines like these which feature extreme accuracy and exceptionally precise control are the answer to progress in welding. Many experts also expect increasing emphasis on automatics.

John F. Galbraith, manager of Linde's research laboratories in Newark, N. J., says that such machines practically eliminate faulty welds. He also believes that an automatic welder is a machine tool and must perform with comparable precision.



This machine handles the long seams on coffeepots (sample is on apron)



This one fastens the bottom to the top piece. Both can handle other jobs too

• Welding the coffeepots requires two machines.

The first one, called the longitudinal seamwelder, handles the side seam; the other, a circumferential welder, attaches the bottom plate to the body side.

To begin, a stamped blank of 0.028 in. stainless is manually loaded into the seamwelder fixture. Pressing two buttons starts the machine cycle of clamping, and unloading.

Hold-down clamps push the joint together with about 300 lb per lineal inch. Argon is fed to the underside of the joint to shield the weld. The head moves to a precise position and makes the weld. At the finish, it automatically retracts and the part is unloaded. (The welding fixture is on a ram moved by an electronically controlled motor.)

To weld the bottom plate to the body, both parts are manually loaded into a fixture on the circumferential welder. An air operated press pivots into the welding station and press assembles the bottom plate flush with the body.

After the press moves to one side, the welding head drops down to the joint, establishes an arc, and starts feeding the argon to the backside of the weld. The entire fixture rotates slightly more than 360 degrees while the welding head remains stationary.

At the end of the cycle, the head retracts, and the coffeepot is stripped from the mandrel.

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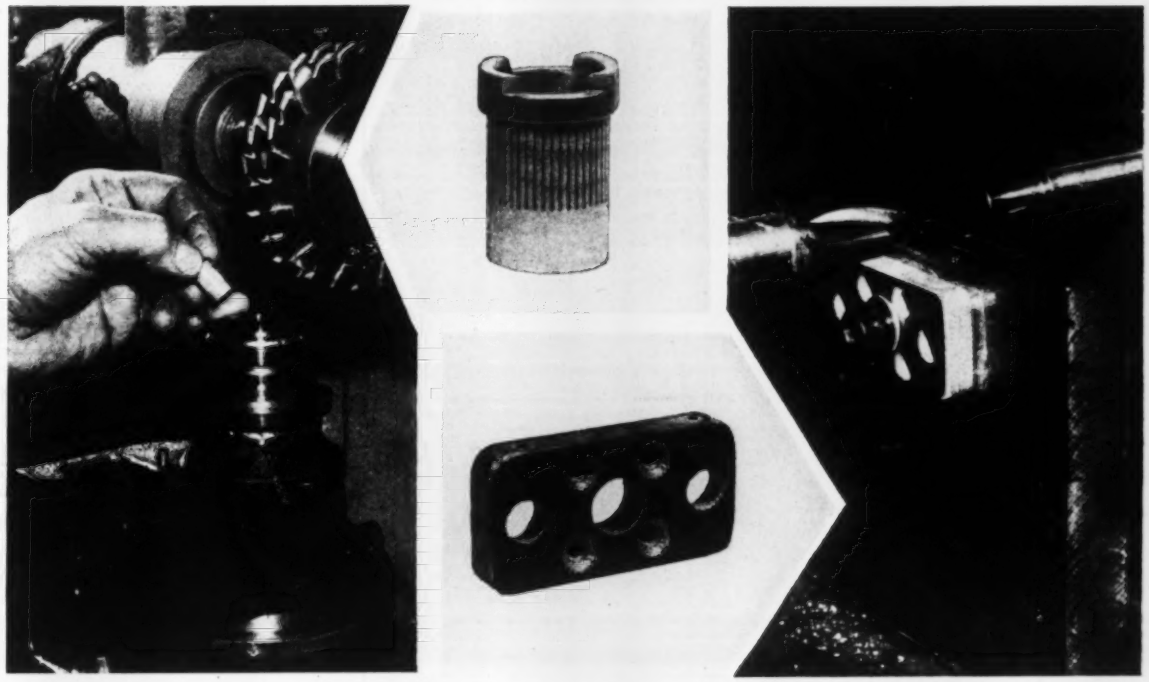
Small Machine Reaps Big Payoff



It takes only 30 seconds to straddle mill the head on this tiny aluminum control switch bushing. A quick-releasing collet speeds up loading and unloading

The periphery of this phenolic Bakelite switch end plate is profile milled in a vertical plane. Production time is 2 minutes at a surface speed of 600 sfpm

Fitted for the relatively small workpieces, this machine has freed its bigger counterparts for heavy duty work. It paid for itself in 18 months out of direct savings

IT'S almost always true that you haven't wrung the maximum savings out of a production job until you are running it on a machine that's exactly suited for the work.

Take the case at Stearman Aircraft Products, Wichita, Kans., where a host of small parts must be produced. No matter how efficiently the jobs were done, ideal savings weren't realized until the production men got a small milling machine for the work.

President Glenn A. Stearman figures that the direct savings paid for the machine in 18 months.

"We have found in the course of using the mill," he says, "that this machine will do many operations normally done on much more expensive tools. This naturally releases heavier tools for the heavier type operations, thus expanding the over-all capacity of our shop."

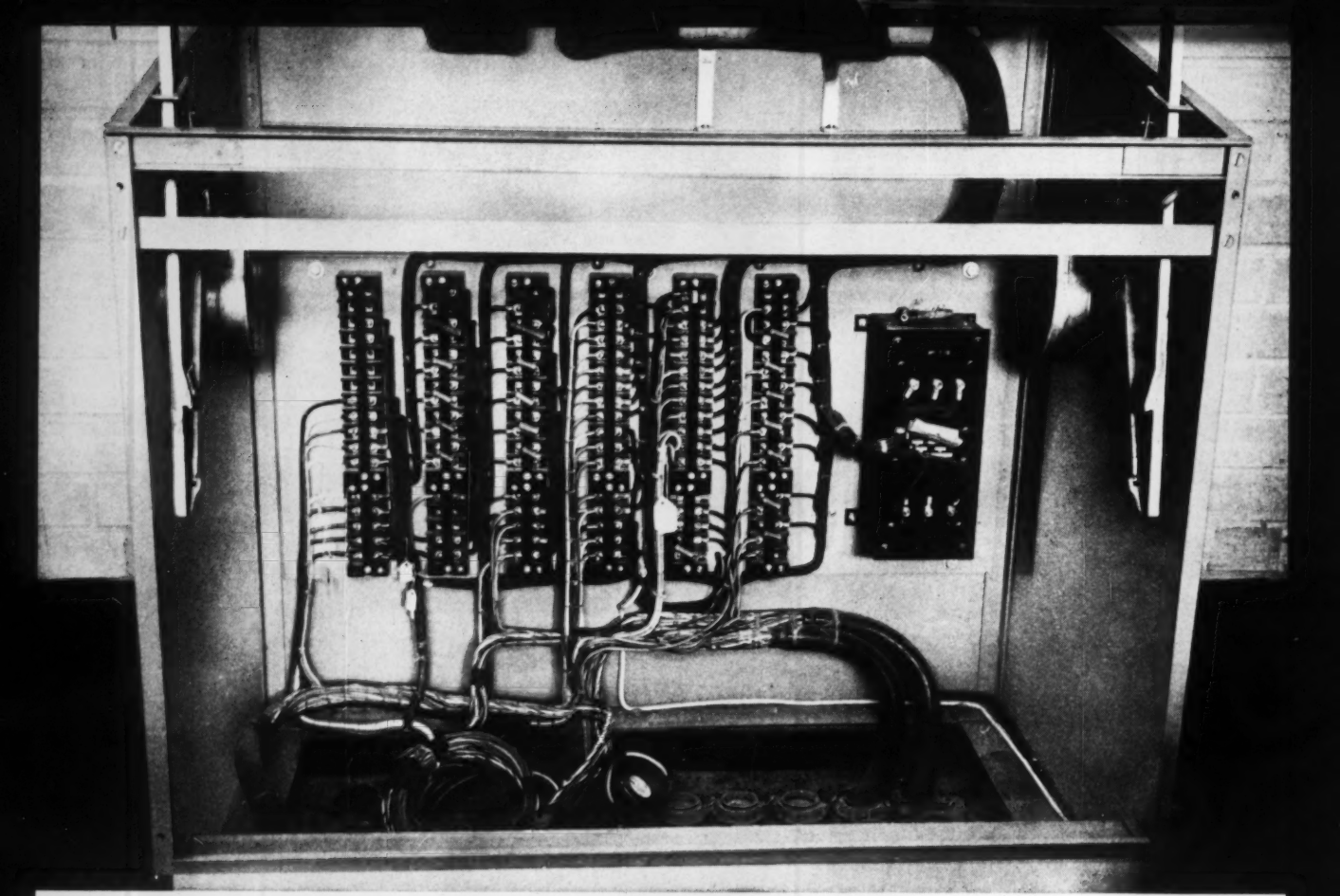
• **The machine, built by U. S. Burke Machine Tool Div., Cincinnati Mfg. Corp., Cincinnati, saves both in setup and operation costs.**

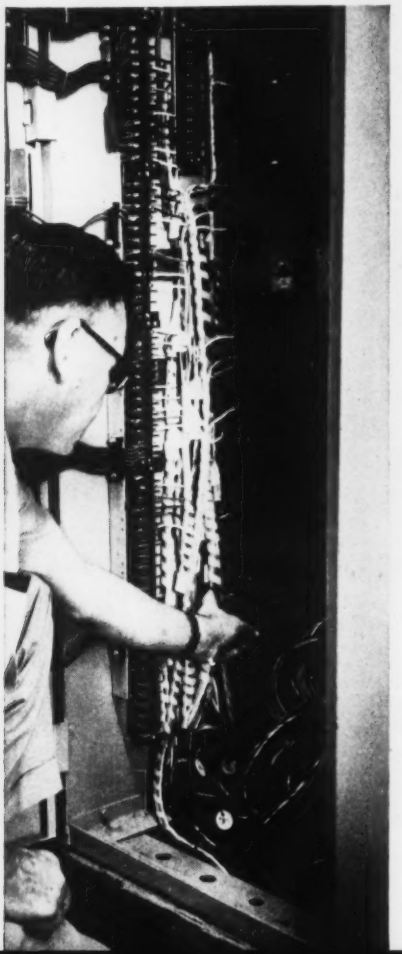
Mr. Stearman points out: "In milling a part on this machine rather than on a larger mill, we can reduce our setup time 50 per cent or more. This is simply because we can use smaller holding fixtures which are lighter and easier to handle. We can also use smaller cutters which obviously cost less."

An even larger share of the savings can be attributed to the difference in hourly rates on the small No. 1 U. S. mill and the larger machines. Depending on which machine it's compared with, Mr. Stearman figures the hourly savings run $1.50 to $3.50.

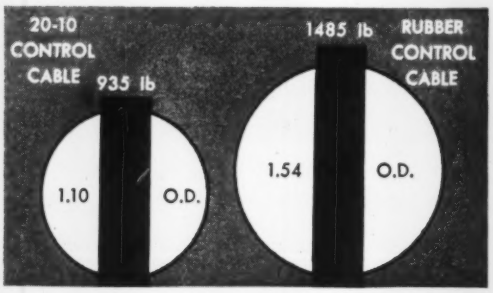
"Cycle time is a little hard to pin down," he continues, "but in a specific production operation, it is often three to four times faster when we put the work on the small mill."

Stearman's management feels it also gets a plus out of the small machine in terms of handling ease. The firm does a great deal of prototype and custom work, as well as a wide variety of tooling, both large and small. The small parts are more easily turned out on the small machine, particularly on the hand milling jobs where operator "feel" is important.





Jobs like this are made simpler from start to finish with Anaconda 20-10 Control Cable. All wiring shown in this control desk of a 15,000 hp motor is Anaconda 20-10 Control Cable.



Comparison of O.D. and Weight per 1,000 Feet of No. 10 Awg 19 Conductor Cable. Ease of installation is inversely proportional to the weight and diameter of the cable. This comparison shows 20-10 to be lighter in weight and smaller in diameter than a conventional rubber control cable. Thus Anaconda 20-10 Control Cable saves on installation costs.

Anaconda 20-10 Control Cable's composite design takes full advantage of both polyethylene and Densheath, giving full IPCEA recommended insulation thickness of 30 mils for 600-volt service.

ANACONDA'S SUPERIOR 20-10 THERMOPLASTIC CONTROL CABLE SIMPLIFIES CABLE NEEDS!

ONE CABLE for practically all 600-volt control cable applications – that's Anaconda's versatile, new thermoplastic 20-10 Control Cable. This means simplification of all your control cable needs – makes ordering, stocking, and installation easier, quicker, and more economical.

Conductors are insulated with 20 mils of polyethylene and covered with 10 mils of Densheath® (PVC). This composite design takes full advantage of the best features of both thermoplastics, and provides full IPCEA recommended insulation thickness of 30 mils for 600-volt service.

POLYETHYLENE conductor insulation provides:

high dielectric strength
low moisture absorption
low power factor
protection against electro-endosmosis
high insulation resistance
low specific inductive capacity
ozone resistance
resistance to chemical attack

DENSHEATH (PVC), as both insulation and covering, provides:

good dielectric properties
excellent flame resistance
excellent coloring ability
excellent abrasion resistance

The application of the over-all Densheath jacket to the cabled composite insulated and covered conductors provides a product that can be installed aerially . . . in conduits . . . in trays or ducts . . . directly buried. Anaconda 20-10, then, is the superior control cable that can offer all the benefits of standardization to industry.

For 1000-volt service, Anaconda has adapted 20-10's design to produce a cable with 30 mils of polyethylene and 15 mils of Densheath (PVC).

Talk to the Man from Anaconda about 20-10, or 30-15, control cables for your applications. And be sure to write for Bulletin DM-5844 for the full technical data on Anaconda 20-10 Control Cable. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

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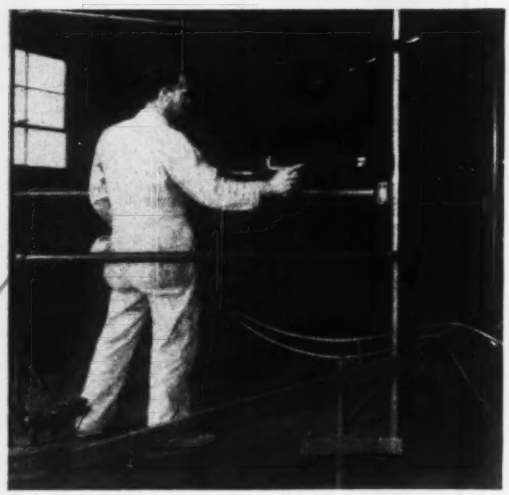

Gator Boat transport trailers are painted in less than half the time—with half the paint—with the new Ransburg Electrostatic Hand Gun.

For instance

Peterson Bros., Inc., Jacksonville, Florida and Ft. Wayne, Indiana, world's largest manufacturer of boat trailers for the Marine Industry, switched from air hand spray to Ransburg No. 2 Process Electrostatic Hand Gun at the Fort Wayne operation in the finishing of their big custom line boat trailers and their Gator line of Marine Trades Equipment.

Paint saving with the Ransburg Hand Gun is estimated at 50 to 60% over the former method. Construction of their products (they use a lot of tubular steel) is ideal for Hand Gun application because of the "wrap-around" characteristic of Electro-Spray.

Painting is done now in an open spray room where two water-wash booths stand idle. Not needed! Maintenance in the paint room has been reduced 75%, for where they used to have to clean up the room sometimes twice a week (mostly on overtime) it now goes two or three weeks without cleanup.

One of Peterson's biggest products now painted electrostatically is a boat transport trailer, Model 807, built to haul six 16-ft. runabout boats. The trailers are over 31-feet long; overall height is 11′-2″ and almost 8′ wide. With air spray, it used to take 8 hours, or more, to paint the big vehicles. Now, with Ransburg No. 2 Process Electrostatic Hand Gun, one operator does the job in only 3½ hours. And, with half the paint!

NO REASON WHY YOU CAN'T DO IT, TOO!

Write for information and literature about this revolutionary, new painting tool. See how the Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. If your production justifies conveyorized painting, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochure which shows numerous examples of modern production painting in both large and small plants.

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Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana

Conduit and Swivel Joints Keep Cables from Workbed

PUTTING cables and tubes in conduit that pivots on swivel pipe joints has eliminated worktable clutter on a milling machine made by a midwestern manufacturer.

The idea keeps the cables lifted free of the work area but flexible enough to move back and forth with the rail and side to side with the spindles as they tilt and slide.

The milling machine shapes intricate aerodynamic shapes from stock as large as 9 x 45 ft. Three high speed spindles, mounted on a traveling crossrail, do the cutting and are supplied by a myraid of cables and tubes supplying power, coolant, and control signals.

Heavy 2 and 4 in. conduit houses the cables and hoses. At the pivot points, Chiksan swivel joints are used. The machine tool maker found that the standard swivel joint using dual ball bearing races was more than strong enough to counteract the weight of the cantilevered conduit.

The swivel joints are made by Chiksan Co., Brea, Calif.

Fastener Weight Reduced More Than 30 Per Cent

Cutting weight? New high strength fasteners (220,000 psi series) can give you weight savings of 33 per cent and more, says Standard Pressed Steel Co., Jenkintown, Pa.

The bolts (LWB 22) and self-locking nuts can replace fasteners on designs using 7075T6 aluminum or harder materials. The new locknut (FN 22) is said to be 50 to 60 per cent lighter.

The fastener can be used for applications up to 550° F. Head configurations are identical to the company's earlier EWB 18 (180,000 psi) series.

Fatigue strength is in direct proportion to the rise in tensile strength. The bolts are made from a 5 per cent chrome, high strength steel (VascoJet 1000 type).

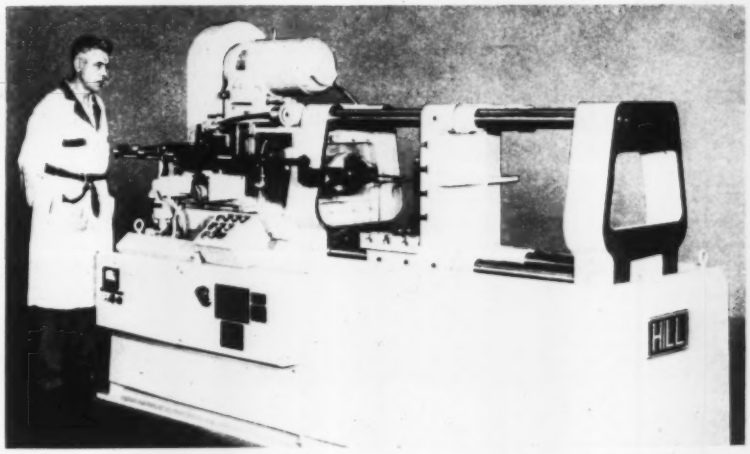
The bolts are made in any desired grip length in 1/16 in. increments. Standard diameter sizes (#10 through 1½ in.) are available.

High Speed Machine Gun Drills, Reams, and Bores

HIGH FEED rates are the key to increased production with the Hill-Drill whether it's being used to gun drill or ream, or to drill with standard high speed steel twist drills.

The machine can feed standard twist drills into steel at ten times the conventional feed rate while maintaining size accuracy and tool life, says the manufacturer. Example: Suggested feed rates for a ½ in. diameter standard twist drill in steel are 40 to 80 ipm.

Key to the high feed rate achievable on the machines is in the design of the motorized drill spindle. Driven by a 10 hp motor through V-belts and a multiple speed drive, the spindle is a 4-in. diameter hollow quill that travels in a honed Meehanite sleeve. Two 3¼ in. diameter hydraulic cylinders advance the quill. They can develop up to 16,000 lb thrust.



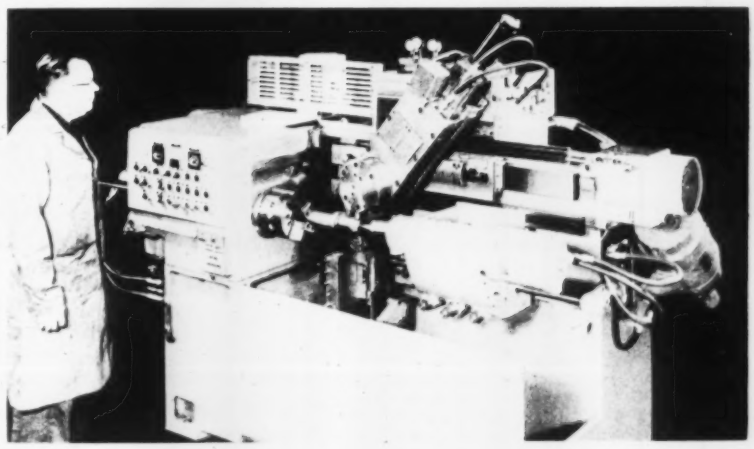
A variety of work setups can be made on the Hill-Drill. Long stock can be fed into the rear of the machine. A second drilling head can be mounted on the opposite end of the machine to perform combination gun drilling and gun reaming operations. Automation for the loading function can be provided as well as index fixture arrangements, chip conveyors, or hopper feeds. The size of the machine, number, and size of drill spindles, hydraulic system, coolant system, and motor sizes can be varied to suit customer requirements.

For more information, *write* Walter P. Hill Inc., 22183 Telegraph Rd., Detroit 19, Mich.

Lathe Roughs, Finishes Parts from Same Template

THREE roughing cuts and a finish turning cut can be made from the same template with the 25 hp Multi-Cycle hydraulic tracer lathe. Accuracy of finished work is assured: The lathe is designed so that the stylus and cutting tool are closely coupled to reduce the possibility of deflection and other errors.

To simplify setup and insure maximum accuracy, graduated scales are provided for dog setting, template positioning, tailstock positioning, and crossfacing slide location. Dial indicators at the top of the tracing carriage permit accurate depth setting of the first three cuts. After the three roughing cuts are



taken, the tool turret indexes for the finishing cycle with a 0.020 in. depth of cut.

That arrangement makes it practical to use carbides for the first three cuts and finish the job with ceramic tools. The machine is designed with the rigidity and speed required for maximum utilization of ceramic tooling.

Model 14T-25 has a transmission type head which provides an automatic speed change for the finishing cut. Two or four speed heads are available on standard models.

The Multi-Cycle feature, in which stock is removed in as many as four cycles, reduces requirements for subsequent grinding or finishing operations. On many jobs, finishes obtained make it possible to eliminate green grinding.

With the Sundstrand tracer lathe, it is possible to turn parts end for end quickly to machine both ends of the part. Quick and accurate positioning of dogs and template reduces the downtime required for changeover and permits the machine to be applied economically on short runs.

For more information, *write* Sundstrand Machine Tool Div., Sundstrand Corp., Belvidere, Ill.

Belt-on-Roller Conveyor

FLEXIBILITY of application and economy of operation are features of a simplified horizontal belt-on-roller conveyor. The Rapistan units will easily handle bags, boxes, cans, cartons, drums, and other items of various sizes, shapes, and weights.

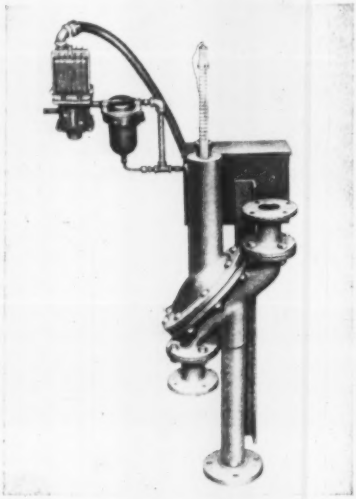
Series 904 is for light to medium duty and Series 905 for medium to heavy duty applications. Both series can be provided with rollers on 3 to 12 in. centers formed of 13 or 16 gage steel. Lengths are pre-engineered standard sections, joined to make the desired unit span. Both series can be readily adapted for use with gravity conveyor or other types of power equipment.

For more information, *write* Rapids-Standard Co. Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.

Controlled Volume Pump Moves Corrosive Slurries

HARD-TO-HANDLE and corrosive slurries can be moved with a volume controlled pump that uses the Oliver diaphragm slurry pump design principles.

Slurries containing up to 60 per cent solids can be delivered at pressures up to 90 psi. Gentle diaphragm action minimizes particle degradation. That feature and the ability to pump against high discharge pressures make the unit effective for handling feeds to filters of all types.



By adjustment of the timing mechanism, it is possible to vary flow volume from 0 to 180 gallons per hour.

For more information, *write* Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.

Transistorized Instrument Sorts Nonmagnetic Metals

A VARIETY of testing jobs can be done with the battery powered, Magnatest FM-110 Conductivity Meter—determination of hardness, alloy, and heat treat condition; sorting mixed nonmagnetic metals; checking tensile strength of aluminum; and many others.

The unit induces eddy currents within the test piece by means of a ½ in. diameter hand-held probe. These currents affect the impedance of the probe coil as a function of the conductivity of the material. With the probe on one side of the test piece, the large knob is turned to zero the meter and conductivity is read on the left-hand scale.

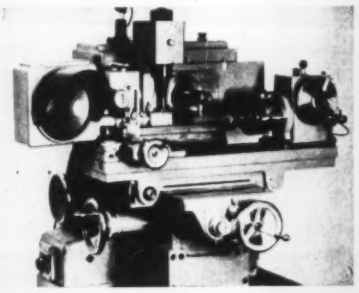
Readings can be taken on a comparative basis using known samples, or in absolute electrical conductivity units as a per cent of the International Annealed Copper Standard.

For more information, *write* Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.

Form and Punch Shaper Projects Part Contours

STRICT control of the machining operation is possible on the K-15 shaper by the use of a 20-to-1 magnification projector which is mounted on the machine.

Tapered punches or forms within a range of ±3 degrees can be machined. Contours of all kinds, surfaces, and punches with curved necks can be machined to a toler-



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ance of ±0.00025 in. in one setting.

The shaper has a large dividing head with automatic circular feed, and a co-ordinate chuck which permits the machining of radiuses, angles, and tapers automatically.

For more information, *write* Jersey Mfg. Co., Livingston Street, Elizabeth, N. J.

Small Size X-Ray Gage Measures Thicknesses

THICKNESSES of many ferrous and nonferrous metals, and many nonmetals, can be measured at speeds up to 6000 feet per minute with a small size x-ray gage that has a pulsed, pencil-thin beam (it radiates briefly many times per second).

The manufacturer says the pulsed x-ray energy source greatly reduces the low radiation level of the thickness gage which requires only a minimum of shielding and makes possible a source unit ⅛ the size of previous units. The new gage can measure thicknesses from 0.00025 to 1.5 in. to tolerances of plus or minus 0.000010 in.

For more information, *write* Daystrom-Weston Sales Div., Daystrom Inc., 614 Frelinghuysen Ave., Newark 12, N. J.

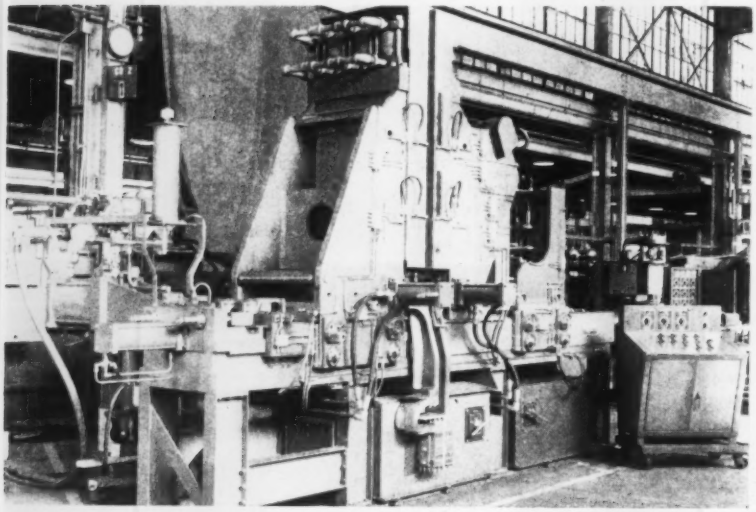
Fluidizer Facilitates Dip Coating of Parts

HERE is a machine for coating objects by the fluidized-bed process. It consists of a vessel with a porous ceramic floor to contain powdered resinous material for dip coating.

The energizing unit consists of an adjustable air turbine driven vibratory unit from which the propelling air (or gas) passes up through a replaceable desiccant cartridge and through the ceramic floor of the vessel. The powdered coating material has the appearance of a boiling liquid as the result of combined aeration and vibration, making it easy to dip parts.

The dip coating process consists of dipping a moderately preheated article into a fluidized powdered coating material for a few seconds. The coating material becomes securely bonded to the part, forming a tough, impact and abrasion resistant dielectric hide. No further curing is required.

For more information, *write* Armstrong Products Co., 351 Argonne Rd., Warsaw, Ind.



END TO END FASTENING of flat wide strip stock is possible with this Sciaky flash buttwelder. It is useful in plating, pickling, stamping, forming, and other operations where a continuous feed of strip stock is essential. In a matter of seconds, a high strength weld is made which is as strong as the parent metal. The machine also shears off flash particles so that a continuous flush surface is maintained. Designated the BPW.3-400H, the machine is designed for welding hot rolled, low carbon steel ranging from 0.060 to 0.200 in. in thickness, and from 12 to 22 in. in width. For more information, **write** Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill.

Motors Dissipate Heat

AN IMPROVED enclosure and ventilating system is designed into this company's rerated frame 364U and larger dripproof, ball bearing KZK motors. Heat dissipating facilities of the motors are well distributed.

The circulation of ventilating air within the motor frame is controlled by a series of integral cast baffles. Cooling air moves in a clockwise spiral through the space between the stator core and the motor frame. The movement of air assures equal cooling for all portions of the stator core and winding, regardless of the direction of rotation.

For more information, *write* Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Timing Belt Drive Cuts Space Requirements

SMALL pulleys, short centers, narrow belts, and high capacities are design features possible with the Time-Tex timing belt drives. The belt is made with steel cable cords imbedded in neoprene fully molded

ON THE REGAL IMPERIAL

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Superior Stainless

STRIP STEEL

At Chrysler Corporation, fine automotive engineering and fine motorcar appearance go hand-in-hand. That's why Chrysler specifies *stainless steel* for essential exterior brightwork where beauty must equal performance, year after service year. ● For over 25 years CHRYSLER has been a regular user of quality stainless strip steel from the mills of Superior Steel—a privilege and responsibility we are happy to uphold.

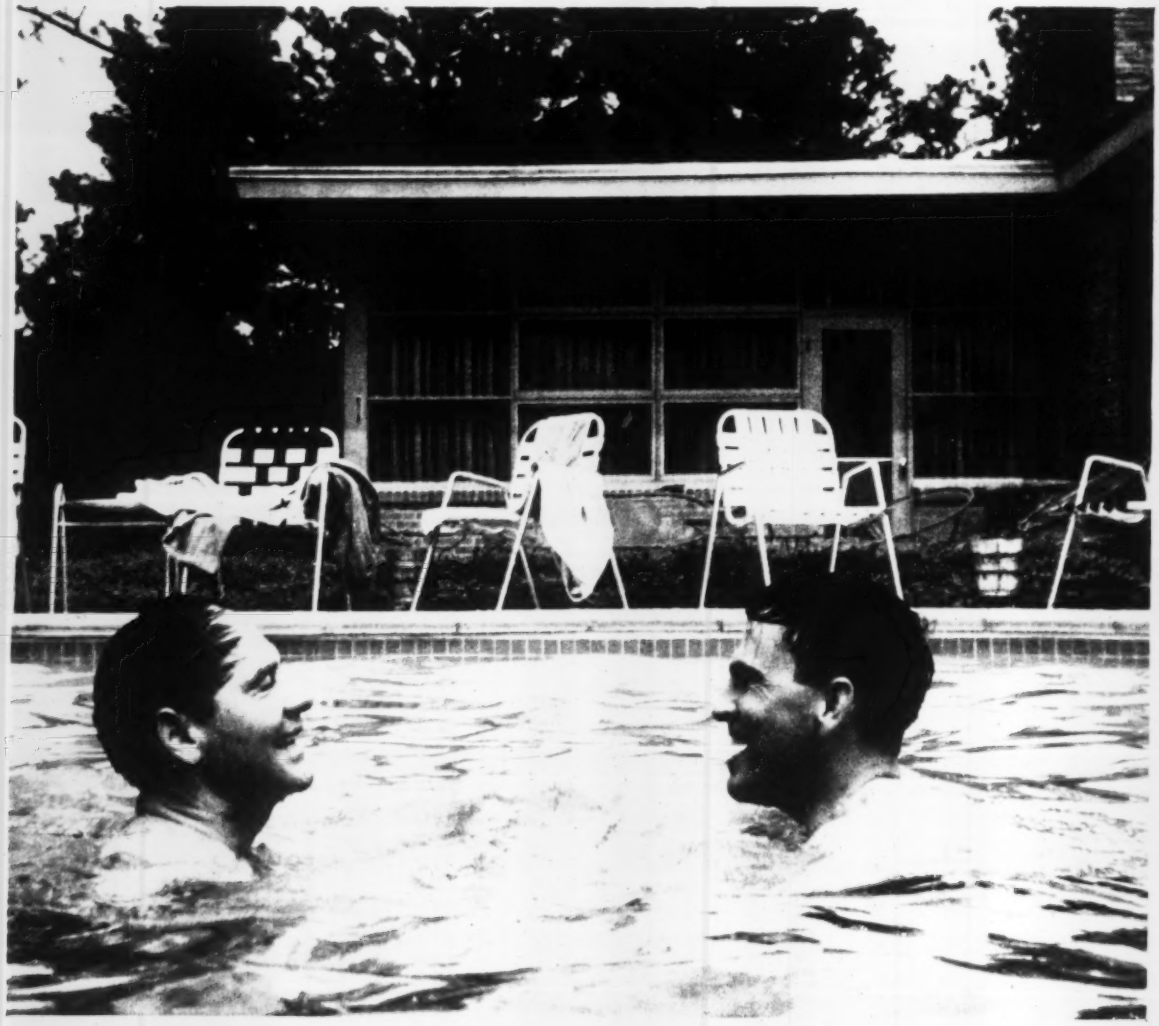
SUPERIOR STEEL DIVISION

OF

COPPERWELD STEEL COMPANY

CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York



This climate cuts our plant costs three ways!

The mild, Top-of-the-South climate in the Richmond-Petersburg-Hopewell-Colonial Heights triangle works for you in many ways. It cuts construction, maintenance and heating costs. It saves weather shutdowns. It means pleasant, low cost living for management and staff.

It also adds extra dependability to your electric power from Vepco's growing network . . . with 1,700,000 kilowatts capability now, and building to more than 2,000,000 by 1961.

For confidential site finding help in this strategic transportation center, write or telephone Vepco today.

VIRGINIA'S
Richmond-Petersburg-Hopewell Triangle

VIRGINIA ELECTRIC and POWER COMPANY
Serving the Top-of-the-South . . . in Virginia, West Virginia and North Carolina

Clark P. Spellman, Mgr., Area Development, Electric Bldg., Richmond 9, Va., MI 9-1411

with nylon base fabric.

It is suitable for a wide range of load applications, from subfractional to 600 hp with a torque load range from thousands of foot-pounds down to light loads in inch-ounces. The drive makes possible a range of speeds from zero to over 16,000 ft per minute.

With the timing belt drive, speed is transmitted uniformly without chordal rise and fall of pitch line, eliminating chatter and vibration. Inherent elimination of friction, lack of high initial tension, and the thin construction contribute to the drive's freedom from heat buildup, which is one of the basic reasons for the loss of mechanical efficiency.

The drives are available in five pitches (tooth center-to-center distance): 1/5, 3/8, 1/2, 7/8, and 1 1/4 in.

For more information, *write* Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Mist Type Coolant Unit

INCREASED production and longer tool life is possible in small precision drilling, tapping, milling, sawing, and grinding operations with the Type J Trico-Mist coolant unit.

The unit operates on shop air line pressure of 50 to 125 psi. Because the mist is achieved by an atomizing principle, there is no air pressure in the reinforced, shatterproof, 8 ounce capacity plastic reservoir at any time. The coolant supply is always visible. Since small jobs only require a small fine mist, one filling will last 8 hours and longer when used constantly.

Each unit includes a magnetic nozzle holder having an adjustable arm so that the coolant can be directed to the cutting edge of the tool.

For more information, *write* Trico Fuse Mfg. Co., 2948 N. Fifth St., Milwaukee 12, Wis.

Hydraulic Pump Is Quiet

MATERIAL handling operations from 1/2 to 2 tons, where pressures to 1500 psi are common and capacities from 1 to 2 gpm are required, can be handled with the Kingsbury slipper type hydraulic pump.

The manufacturer points out that the Kingsbury thrust bearing prin-

MAGOR
AIR DUMP
CARS

New Magor Air Dump Cars are designed to take the toughest punishment—and keep going! Rugged end construction of double plate across load carrying members and tapered end design shrug off abuse. Alloy steel in structural members, wearing parts gives added strength where it's needed most! Except for the rubber coupling hose at the ends of the car, the entire air supply system is made of extra heavyweight black steel pipe, immune to damage by heat of lading!

These are really rough and ready cars, designed specifically for the job—built to last! Every feature (and we've mentioned only a few) is made to take the tremendous beating that goes with Steel Plant operation.

MAGOR

For the full story, write today for the new folder, "The Answer to High Refuse Disposal Costs."

MAGOR
CAR CORPORATION

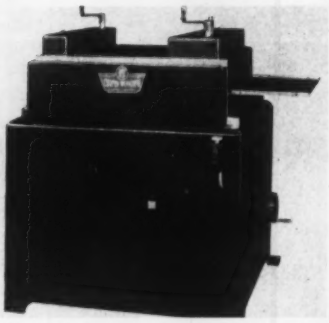
50 Church Street
New York 7, N.Y.

ciple is used in the new pump slippers which support the load on a hydrodynamic oil film, giving minimum friction, quiet operation, and maximum dependability. Slippers exactly fit the bore contour instead of giving just the line contact normally obtained with vanes.

For more information, *write* Mechanisms Inc., 118 E. Second St., Uhrichsville, Ohio.

Unit Straightens Stamping At High Production Rates

USEFUL to manufacturers, assemblers, and finishers of flat stampings, this 20 in. part straightener reduces expensive hand fitting in assembling such products as office machines and appliances, and provides improved performance for functional



parts such as clutch discs and backing plates, and better appearance for painted or plated items.

The machine will handle flat stampings as well as coils and strip up to 20 in. wide. It will smooth and flatten to within 0.001-0.002 in. at feed rates from 10 to 50 ft a minute. Design and construction features include a two point adjustment for fast, precise setup and changeover, and four separate gear trains to drive all rolls, equalize drive and bearing loads, and provide smooth, quiet, high speed operation.

For more information, *write* Cooper Weymouth Inc., 603 Honeyspot Rd., Stratford, Conn.

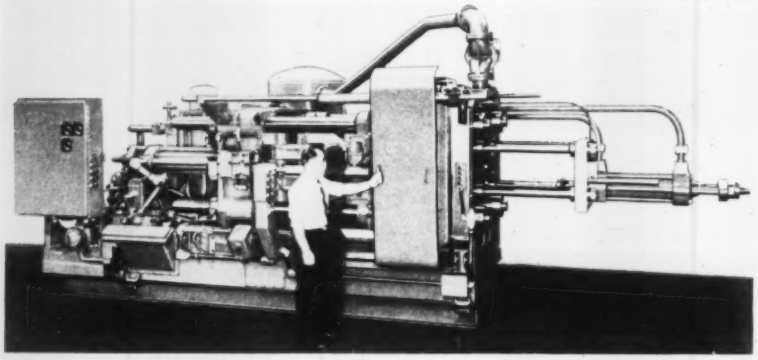
Units Control Parts Flow

TWO versatile units can control and co-ordinate chuted parts flow in manufacturing installations using automatic handling systems. They can be mounted on Lamb FabriFlex chuting without alterations and can also be used on most chuting configurations of open design.

The Standard Line Switch Interlock indicates parts accumulation at a given point and produces an electrical signal which can be used to control any machine, fixture, or handling function.

The Shot Bolt Interlock permits or prevents parts flow and can be operated automatically or manually from a remotely located pushbutton. With the solenoid or pneumatically operated stop bars arranged to deflect parts into outlet chutes, multiples of this unit can be used to distribute and feed parts to as many as five machines.

For more information, *write* F. Jos. Lamb Co., 5663 E. Nine Mile Rd., Detroit 34, Mich.



Diecaster Produces 10 lb Aluminum Parts

ALL types of cold chamber diecasting can be done on the 600 ton, Reed-Prentice diecasting machine.

Hand ladling, automatic ladling, or automatic feed through the Reed Vacufeed system can be utilized. The Vacufeed method combines automatic feeding with vacuum diecasting, attaining speeds equal to those in zinc diecasting.

Aluminum diecastings weighing up to 10 lb can be produced on the machine.

The diecaster has an adjustable die stroke of 12½ to 18½ in. Die plates measure 47 by 46½ in., giving 28½ by 28½ in. clearance between tie bars.

The shot cylinder on the machine is provided with an adjustable slow start to allow complete venting of sleeve and runner systems. To accommodate different length sleeves, the shot cylinder stroke is adjustable in a 6-in. range of initial phase of stroke, making complete stroke adjustable from 14 to 20 in.

For more information, *write* Reed-Prentice Div., Package Machinery Co., East Longmeadow, Mass.

Electrical Discharge Tools Cut Die Machining Costs

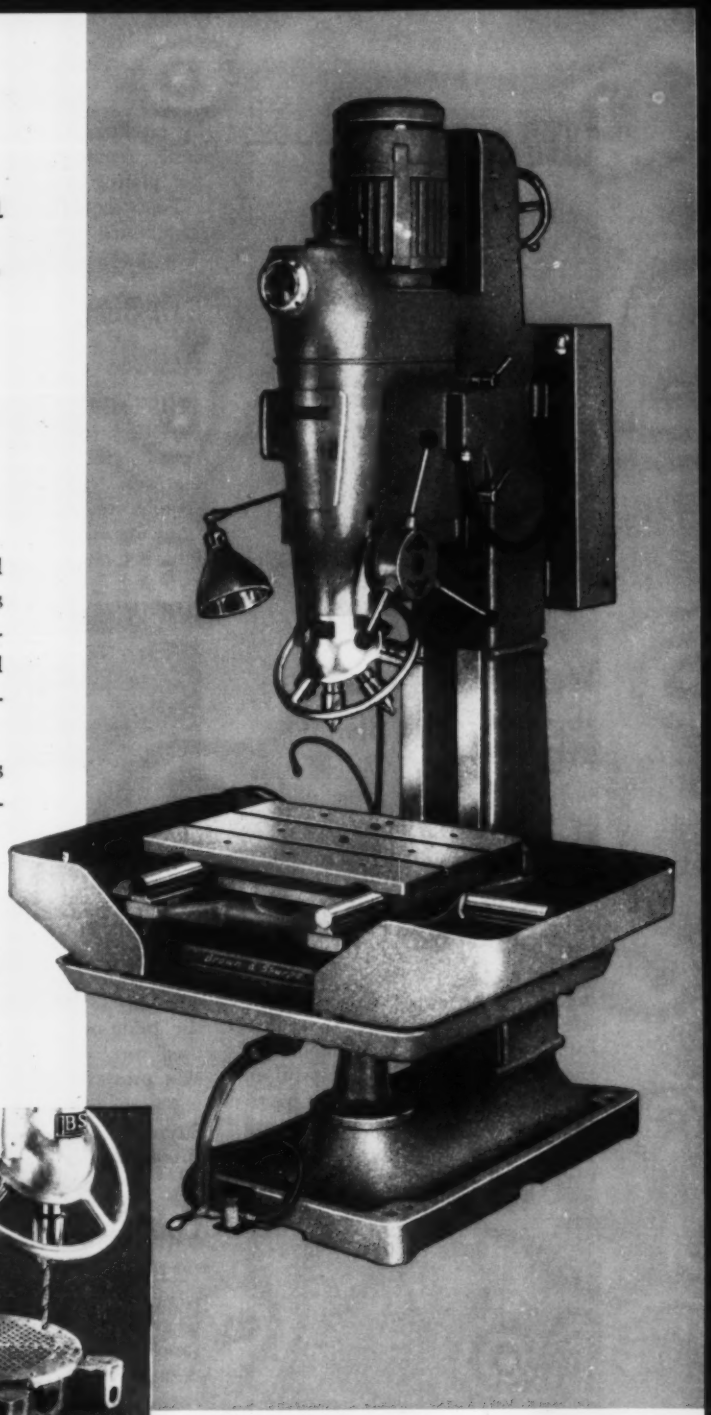
THREE-DIMENSIONAL cavities can be produced on the RP-100 Series electrical discharge machine tools at 25 to 50 per cent savings over mechanical methods, says the manufacturer. The machines can be used to produce extrusion,

Now... you can drill - tap - bore - ream 2 to 5 times faster

- at a single station
- without box jigs
- with one set-up
- any hole pattern

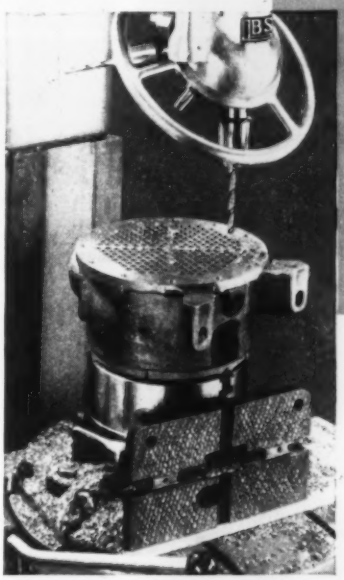
Multiple drilling operations at a single station, and fast, accurate hole location without expensive jigs are only two of the major advantages of the revolutionary Brown & Sharpe Turret Drilling method that is setting entirely new standards for production drilling economy.

Find out how it can help you beat mounting costs . . . save handling time, set-up time, capital investment, floor space, and maintenance.



The Brown & Sharpe TURRET DRILLING MACHINE pays for itself with record savings on jobs like this

Drilling and tapping tube sheets at the Whitlock Mfg. Co., West Hartford, Conn., makers of heat transfer equipment, is an example of the hundreds of installations where users report record savings in time and costs. On the B&S Model A Turret Drilling Machine, 220 tube holes are drilled, and 12 bolt holes drilled and tapped, in 22 minutes. The B&S Work-positioning Table permits easy, progressive movement and accurate location of the workpiece for each hole — saves the time formerly required for a complete layout of the hole pattern on each piece. Completely eliminates the need for guide bushings.



TWO SIZES

MODEL A (shown) 6 spindles • ½" drilling and tapping capacity in steel • table work surface 22" x 24".

MODEL B 6 spindles • 1" capacity in steel • table work surface 28" x 32" • may be equipped with any standard numerical (tape) control system for fully integrated automatic work-positioning and machining.

For complete information, write:

Brown & Sharpe TURRET DRILLING DIVISION, Inc.

20 Fitch St., East Norwalk, Connecticut

Brown & Sharpe PRECISION CENTER

powdered metal, cold heading, blanking, and multiple pierce dies.

The series can use any Elox vacuum tube or RC power supplies. Electrical mechanical power feed or hydraulic power feed is available. Precision locating devices and electrode holding devices can be furnished.

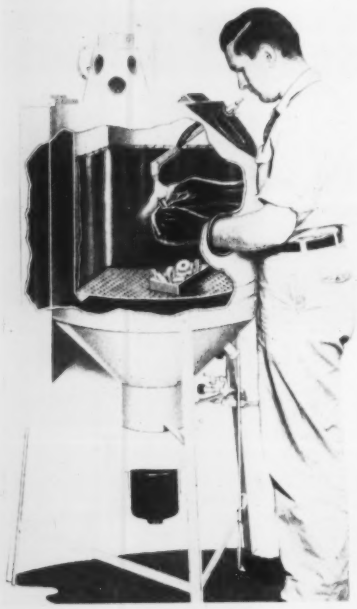
A complete dielectric oil system consisting of reservoir, pumps, and filters is built into the base of the machine.

For more information, *write* Elox Corp. of Michigan, 1830 N. Stephenson Highway, Troy, Mich.

Wet Blaster Deburrs, Hones, Cleans, Blends

FAST and efficient honing, cleaning, deburring and blending can be done in the Model LB-1002 Liqui-Breez wet blaster.

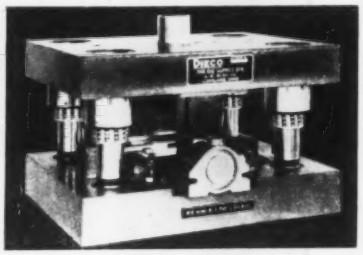
In honing, the cutting efficiency of high speed steel and tungsten-carbide cutting tools can be increased as much as 500 per cent, says the manufacturer. In cleaning, the machine removes all minute particles and foreign matter from metal surfaces. In deburring, the method is highly successful in removing both loose and tight burrs. In blending, directional lines caused by machining and grinding can be easily removed, preparing surfaces for plating or painting.



For more information, *write* Tobin-Arp Mfg. Co., 6400 Penn Ave. S., Minneapolis, Minn.

Ball Bearing Die Set Assures Alignment

THIS ball bearing die set eliminates burred parts, reduces rejects, and extends the life of dies between regrinds. Because it is easy to assemble and disassemble, it materially reduces the time spent in die building and changeover.



Preloaded ball bearings provide negative clearance so that even after millions of strokes there is no chance of dies shifting and breaking down because of misalignment. The die set can be stripped from the guide posts, an advantage when used on inclinable and straight side presses.

For more information, *write* Die Supply Div., E. W. Bliss Co., 1400 Brookpark Rd., Cleveland, Ohio.

Coolant Stops Rusting

HERE is a water soluble metalworking coolant that the manufacturer says will stop rusting, resist rancidity, and reduce the threat of dermatitis.

Called Cold Stream, the product will stay clean for weeks, even when used on cast iron. Since the coolant does not hold dirt in suspension, the problems inherent in dirty coolants are eliminated. It is also said to provide superior finishes and extend tool life.

The coolant has a combination of anodic and passivating rust inhibitors to guard against electrolytic corrosion and moisture.

For more information, *write* S. C. Johnson & Son Inc., Racine, Wis.

NEW literature

Write directly to the company for a copy

Selecting Coil Slitters

"Slitting Lines for Coils and Sheets," 76 pages, contains information on design, selection, and operation of slitters and slitting lines. It also presents time studies and analyses of operating cycles. Yoder Co., 5500 Walworth Ave., Cleveland 2, Ohio.

NEMA Limit Switch Data

Suggestions for the proper application of industrial limit switches have been published by the National Electrical Manufacturers Association. Micro Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill.

Data on Industrial Gases

A 32 page booklet covers the production and commercial applications of all currently available industrial gases. Air Reduction Sales Co., 150 E. 42nd St., New York 17, N. Y.

How to Select Rectifiers

A 24 page brochure describes a step-by-step method for selecting the right selenium rectifier for a circuit. Semiconductor Products Dept., General Electric Co., Syracuse, N. Y.

Leaded Steel Tubing

Tables in Data Memorandum No. 24 list the chemical composition and the mechanical properties of leaded C-1020 carbon steel tubing. Superior Tube Co., 1508 Germantown Ave., Norristown, Pa.

Spiroid Gears Manual

"Lower Cost Design Begins with Spiroid Gears" helps determine basic design requirements such as ratings, selections, center distances, bearing loads, and mounting methods. Spiroid Div., Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.

Flat High-Carbon Spring Steel

Catalog 579 includes a conversion chart showing relationships between Rockwell, Rockwell Superficial, Tukon, and other testers, weight calculation tables and nomographs, sheet metal gage comparison tables, edge specifications, and basic hardness definitions. Athena Steel Div., National-Standard Co., Clifton, N. J.

Aluminum Tooling Plate

"Reynolds Wrought Aluminum Tooling Plate Type 33" describes properties, specifications, and availability of this material. Dept. PRD-14, Reynolds Metals Co., P. O. Box 2346, Richmond 18, Va.

Electric Motor Catalog

A 12 page catalog describes the basic line of Redmond fractional horsepower electric motors, blowers, and special products. Redmond Co. Inc., Owosso, Mich.

AIRBORNE *TACAN* DEMANDS THAT PARTS LIKE THIS FIT PERFECTLY, EVERY TIME

. . . and here's how ITT's Standards Lab makes sure they do

This heater and cathode contact ring assembly is used with a lighthouse-type electron tube in the airborne unit of TACAN, a military and commercial aerial navigation system.

As in all TACAN components, this mating part must be readily *interchangeable* in case of component failure. So Federal Telephone and Radio Company, a Division of International Telephone and Telegraph Corporation, turned to their Standards Laboratory *before* starting production.

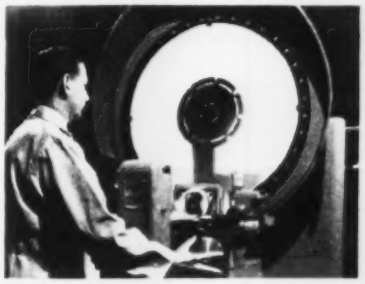
The heater and cathode contact ring was *optically* inspected on a Kodak Model 30 Contour Projector. After analyzing the results, minor changes in tooling were suggested. Result: a perfectly matched part, completely concentric and interchangeable.

Whatever you're inspecting . . . Whether it's tools, gages, dies, electrical or mechanical components, the Kodak Model 30 Contour Projector provides you with a projected image that's as *free* from distortion as the science of optics will permit . . . *accuracy* across the entire face of the big, 30-inch screen. Images are sharp, high-contrast; erect and unreversed at all magnifications. Changes in magnification can be made at the flick of a switch.

More refinements . . . You also get efficient head-on surface illumination and a full 16″ throat clearance between collimator lens and front mirror. This clearance is constant at all magnifications, permits staging of large parts without repositioning.

The many other advanced refinements, extreme optical stability, and rugged construction of the Model 30 Kodak Contour Projector make it a leading choice for large-screen precision micrometry or routine gaging.

Cut inspection costs . . . Along with accuracy, optical gaging with Kodak Contour Projectors offers you savings in gage costs, increased inspection rates, and the economies that result from a minimum of operator training. You can use optical gaging almost anywhere in your plant . . . receiving, assembly, production, inspection, toolroom. There are 6 Kodak Contour Projectors to choose from, one matched to your inspection needs. Get all the facts by writing for our detailed catalog.



At the ITT Standards Laboratory, the Kodak Model 30 Contour Projector provides the accuracy needed for testing and servicing master mechanical and electrical measuring devices.

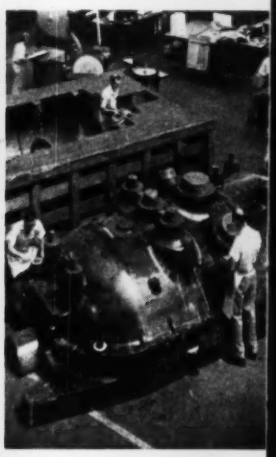
Special Products Sales

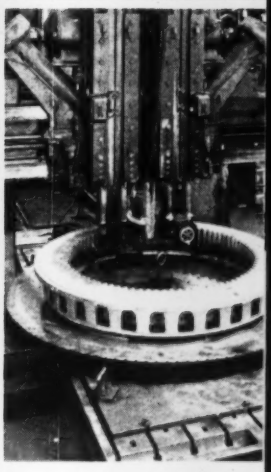
EASTMAN KODAK COMPANY, Rochester 4, N. Y.

the KODAK CONTOUR PROJECTOR

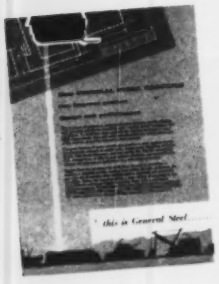
Kodak
TRADE MARK

...where industrial progress is cast in steel





PRODUCTION FACILITIES... COMPLETE AND MODERN



Write for folder: **How General Steel Castings Can Improve Product Design and Performance.** General Steel Castings, Station 230, Granite City, Illinois.

General Steel's large plants have complete facilities for producing, testing and machining castings to your specifications. Here are the facilities needed for quality production to suit your specialized requirements in cast steel structures . . . and steel castings used in cast-weld and composite structures.

Each plant maintains its own pattern, core making and molding departments, staffed by skilled craftsmen. Melting facilities capable of producing the correct steel for castings weighing up to 100 tons are complemented by the most modern foundry equipment available. Modern cleaning and finishing equipment, extensive heat treating facilities, specialized machine tools and the latest in non-destructive testing . . . radiographic, magnetic particle and ultra-sonic inspection devices . . . complete the picture.

General Steel's services range from application analysis before the product is designed to field service after the product is in use. Let us demonstrate how cooperative teamwork can make all this skill and knowledge available to you.

GENERAL STEEL CASTINGS

GRANITE CITY, ILL. · EDDYSTONE, PA. · AVONMORE, PA.

July 13, 1959

Mills Ship Heavily as Deadline Nears

DESPITE CUTBACKS in ingot production, steelmakers are shipping finished goods to users at maximum speed. They're out to clean up June carryovers in case Dave McDonald pulls out his United Steelworkers. Thanks to the two week extension of contract talks, arrearages on sheets and plates have been reduced materially.

Users welcomed postponement of the strike deadline. Instead of canceling tonnage or asking mills to delay shipments, they continued to press for immediate delivery.

CONSUMERS UNWORRIED— Although contracts are slated to expire at midnight on July 14 and chances for another extension appear dim, consumers aren't worried. Their thinking seems to run along these lines: Their inventories are adequate, or they can get what they need from service centers. There won't be a strike. Or if there is one, it won't last too long.

SHIPMENTS PAST PEAK— May's shipments (8,754,119 net tons) were the largest ever for a single month. Records were set in four product groups: Bars and tool steel (1,337,140 tons), pipe and tubing (1,140,669), line pipe (443,181), and drawn wire (341,953). Shipments for construction and maintenance were the largest in history: 1,184,728 tons (vs. 1,175,463 in May, 1957). Automotive shipments (1,736,994 tons) were more than three times what they were in May, 1958 (526,948). During this year's first five months, 38,219,140 net tons of finished steel were shipped.

MARKET LOOKS STRONG— Although some consumers booked July and August tonnage as a purely precautionary measure (so that they'd be first in line for shipment after a strike), many have discovered that they're going to need the steel as soon as it's delivered. As consumption rates increase, users are spreading their orders over the next three months and asking suppliers to furnish bigger than normal tonnages. Even if 15 per cent of the steel scheduled for shipment this quarter were wiped off the books, output of many products (flat-rolled items especially) would remain at a high level. Many steelmakers are sold out for July and August on sheets. September orders are coming in at a brisk rate.

SECOND HALF FORECAST— Barring a strike, third quarter steelmaking operations should average 65 per cent of capacity. Production will be about 24 million ingot tons. Fourth quarter operations should be 10 points higher, with a yield of 28 million. If the second half's 52 million tons are added to the first half's 64 million, this will be the industry's second best year.

IMPORTS AT RECORD HIGH— During April, imports of steel mill products hit an all-time high of 359,450 net tons, outweighing exports (178,029) by a 2 to 1 margin. During the first four months of 1959, imports set a record of 1,117,005 tons. Exports fell to a 20 year low (684,891 tons).

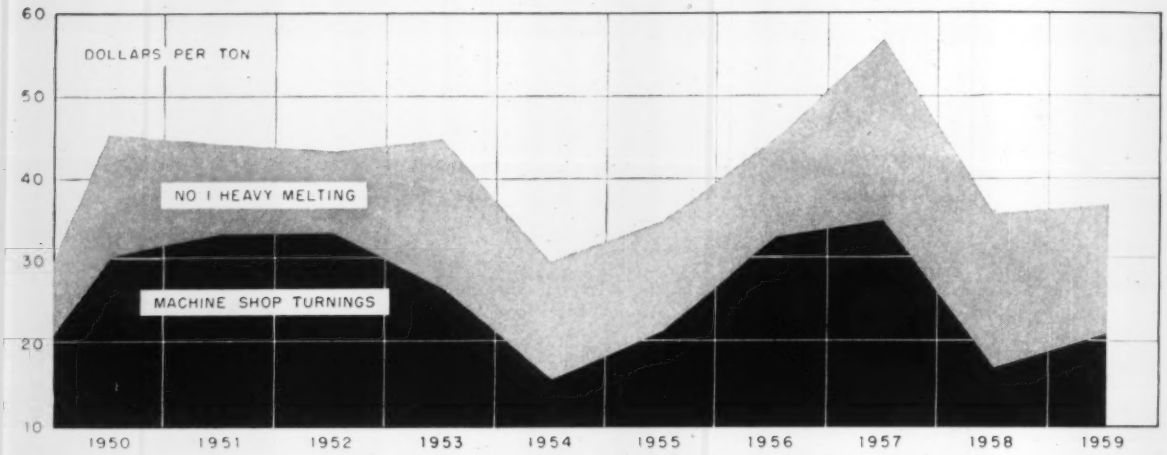
INGOT RATE REBOUNDS— Last week, steelmaking operations advanced 4 points to 82.5 per cent of capacity. Production was about 2,336,000 ingot tons. The 10 point drop in operations since June reflects a tapering off in demand for steel, the banking of furnaces for maintenance and repairs, labor unrest, strike preparations at some mills, lower efficiency because of hot weather, and vacation shutdowns in consuming industries.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Bars, Merchant	150	142
Reinforcing	150	143
Boiler Tubes	...	*
Canada	...	148
Clad Steel	...	146
Coke	...	148
Coal Chemicals	...	148
Charts:		
Finished Steel	...	141
Ingot Rate	140	...
Scrap Prices	...	153
Comparisons	...	141
Contracts Placed	160	...
Contracts Pend.	160	...
Electrodes	...	*
Fasteners	150	145
Ferroalloys	...	*
Fluorspar	...	148
Footnotes	...	145
Imported Steel	139	148
Ingot Rates	140	...
Metal Powder	...	148
Nonferrous Met.	156	158
Ores	139	148
Pig Iron	150	147
Piling	...	142
Plates	150	142
Plating Material	...	159
Prestressed Strand	...	145
Price Indexes	...	141
Producers' Key	143	...
R.R. Materials	...	145
Refractories	...	148
Scrap	152	154
Semifinished	140	142
Service Centers	140	147
Sheets	150	143
Shipments	140	...
Silicon Steel	...	144
Stainless Steel	...	146
Strip	150	144
Structurals	159	142
Tin Mill Prod.	139	144
Tool Steel	...	146
Tubular Goods	159	146
Wire	140	144

*Current prices were published in the July 6 issue and will appear in subsequent issues.

Comparative Prices at Pittsburgh



Turnings Sellers Seek Wider Market

CONSUMPTION of borings and turnings (the waste from machining and drilling) is recovering, thanks to increased blast furnace production.

Average monthly use since the start of this year is an estimated 282,000 net tons. Barring a prolonged steel strike, consumption could hit 3.4 million tons this year —a whopping 73 per cent above the 1,967,000 tons used in 1958 (see accompanying table).

While consumption figures are encouraging, problems still beset the marketing of borings and turnings.

• Problem No. 1: A large proportion of the grade goes to blast furnaces, which may contract as a market.

Limited amounts are taken by the open hearths, foundry cupolas, and the chemical industry, but most of it goes to blast furnaces. Consumption and prices rise and fall with pig iron operations.

• Problem No. 2, which involves the whole range of scrap products, is the technological advance in iron and steelmaking.

Direct reduction will eliminate the blast furnace. Several developments are already reducing the need for scrap or imposing higher quality specifications: Increased blast furnace capacity; growing use of oxygen in blast furnaces; use of high purity oxygen in open hearth operations; more direct charging of iron ore into steelmaking furnaces; increased availability of sinter; rising use of beneficiated ores.

Beneficiated ores constitute a growing proportion of the blast fur-

Blast Furnaces Pace Turnings Use

Year	BLAST FURNACE ACTIVITY Iron Output (net tons)	% of Capacity	CONSUMPTION OF BORINGS & TURNINGS (net tons)
1950	65,484,168	91.5	2,803,925
1951	71,233,761	98.3	3,691,037
1952	62,158,591	84.2	3,372,392
1953	75,842,759	95.5	3,934,437
1954	58,638,117	71.6	2,924,545
1955	77,800,831	92.7	3,809,052
1956	75,965,475	88.9	3,531,360
1957	79,339,671	91.4	2,806,720
1958	57,764,100	63.5	1,966,720
1959*	35,103,720	89.7	1,411,108

*First five months; borings and turnings tonnage estimated.

nace burden. During 1958, ore consumed per ton of iron produced was 328 lb less than it was in 1948. Of a total 100.5 million tons of ore used, 34.9 million were sinter, pellets, briquets, nodules, or other agglomerated products. Five stacks can now turn out as much iron as six could formerly.

The technical advances require higher quality, a real headache for those dealing in borings and turnings because the grade is especially subject to contamination. Despite care in collection and preparation, it's difficult to isolate all the tramp elements from shop collections.

The impact of the technological revolution is reflected in the scrap price structure. Since 1950, the spread between No. 1 heavy melting (the base grade) and borings and turnings has widened from $10 in the early 1950s to around $16 today. In 1957, the spread was $22 (see chart).

What can the scrap industry do about the problems?

• Solution No. 1 is to pay closer attention to collection costs, grade segregation and preparation, freight rates, merchandising, and market research.

Scrapmen are joining with steelmen in promoting quality research, better mill handling practices, and related activities.

Some large producers of borings and turnings, such as automotive plants, maintain higher quality by careful segregation. A number operate their own briqueting facilities. They usually use the briquets in their own operations. Some scrap firms also do briqueting, often on a toll basis.

• Solution No. 2 is to find new markets for borings and turnings.

A growth possibility is briqueting. Briquets now account for less than 5 per cent of the borings and turnings marketed, but the percentage could be greater. Exports are a possibility.

More foundry use of the grade in loose form in cupolas may result because of newly developed equipment for injecting the borings into the melting zone.

Another possibility may be the use of borings and turnings in powder metallurgy, but the potential market is small.

Conclusion: Although borings and turnings account for only 3 to 5 per cent of scrap consumption, they're still a vital part of the market. They'll continue to be important if the industry can reduce contamination and find new uses.

Iron Ore . . .

Iron Ore Prices, Page 148

Shipments of Lake Superior iron ore in June totaled 12,987,302 gross tons, up 4,946,329 tons from the 8,040,973 moved in the like month of 1958, reports the American Iron Ore Association.

The movement in the 1959 season to the end of June amounted to 28,732,533 tons, an increase of 16,568,399 compared with the 12,164,134 tons shipped in the like period of last year.

Steep Rock Iron Mines Ltd., Atikokan, Ont., reports that its 1959 shipments of high grade iron ore passed the 900,000-ton mark on June 30 compared with 172,735 tons shipped to the end of June in the 1958 season. The June total was 394,997 tons vs. 83,698 in June last year.

Import Steel Prices Hold

No new foreign steel prices are reported at Houston. After a period of gradual increases, sellers had expected sharp jumps in imported steel quotations, especially if the U. S. mills were closed by a strike. With the wage negotiations extended to July 15, it's thought speculators are biding their time before tacking still higher prices on imported products.

Tin Plate . . .

Tin Plate Prices, Page 144

Tin plate producers were pretty well cleaned out of inventory at the end of June because users had taken delivery as fast as the material was produced. Consumer eagerness for shipments has now disappeared, and mills expect to replenish their stocks to some extent before the July 15 strike deadline. Customers of

Iron Ore Statistics—May, 1959

Stocks of Iron Ore and Agglomerates in U. S. and Canada
(Gross tons)

STOCKS AT	U. S. Ores L. Superior	U. S. Ores Other	Canadian Ores L. Superior	Canadian Ores Other	Foreign Ores	Total For Month
U. S. Furnaces:						
Eastern	2,634,710	250,943	94,722	1,051,438	3,570,703	7,602,516
Pitts.-Valley	5,727,237	49,078	267,237	1,613,341	3,141,661	10,798,554
Cleve.-Detroit	5,683,156	103,240	252,389	206,930	412,965	6,658,680
Chicago	7,057,084	(a)	(a)	.....	(a)	7,057,084
Southern	(a)	1,942,253	.....	(a)	2,108,675	4,050,928
Western	.....	947,147	.....	.....	.....	947,147
Total	21,102,187	3,292,661	614,348	2,871,709	9,234,004	37,114,909
At U. S. Docks:						
Lake Erie	2,756,228	.....	70,562	1,178,568	.....	4,005,358
Other	.....	.....	.....	(a)	(a)	(a)
Total	2,756,228	.....	70,562	1,178,568	(a)	4,005,358
Total U. S. Stocks	23,858,415	3,292,661	684,910	4,050,277	9,234,004	41,120,267
Total Canadian	1,148,156	.....	53,860	277,123	49,416	1,528,555
Total U. S.-Canada	25,006,571	3,292,661	738,770	4,327,400	9,283,420	42,648,822

Consumption of Iron Ore and Agglomerates in U. S. and Canada
(Gross tons)

In U. S. Districts:	U. S. Ores L. Superior	U. S. Ores Other	Canadian Ores L. Superior	Canadian Ores Other	Foreign Ores	Total For Month
Eastern	852,408	225,104	31,668	259,721	1,068,459	2,437,360
Pitts.-Valley	2,309,331	126,373	101,646	432,114	710,085	3,679,549
Cleve.-Detroit	1,366,724	75,170	89,292	61,704	146,743	1,739,633
Chicago	2,301,821	(a)	(a)	.....	(a)	2,301,821
Southern	(a)	687,569	.....	(a)	284,537	972,106
Western	.....	717,941	.....	.....	.....	717,941
In U. S.:						
Blast furnaces	5,083,366	1,203,440	176,519	477,487	708,311	7,649,123
Steel furnaces	171,784	81,343	3,411	25,302	605,553	887,393
Sintering (1)	1,574,052	546,589	42,676	250,750	895,830	3,309,897
Miscellaneous (2)	1,082	785	.....	.....	130	1,997
Total U. S.	6,830,284	1,832,157	222,606	753,539	2,209,824	11,848,410
In Canada:						
Blast furnaces	265,240	.....	84,988	88,662	.....	438,890
Steel furnaces	3,833	.....	.....	14,636	11,084	29,553
Sintering (1)	58,607	.....	21,234	21,059	5,255	106,155
Miscellaneous (2)	.....	.....	.....	.....	.....	.....
Total Canada	327,680	.....	106,222	124,357	16,339	574,598
Total U. S.-Canada	7,157,964	1,832,157	328,828	877,896	2,226,163	12,423,008

a—Individual company data included in other districts.
1—Consumed at sintering plants not located at mine site.
2—Sold to nonreporting companies or used for purposes not listed.
Data from American Iron Ore Association.

the mills appear to have adequate stocks.

Distributors . . .

Prices, Page 147

Unless there is a steel strike, bookings by steel service centers this month will be slow. July is traditionally one of the slowest months of the year because of mass vacations and hot weather.

June shipments topped those in May by 15 to 30 per cent. About ten days before steel wage contracts were scheduled to expire, consumers turned to distributors to supplement orders they had placed with the mills. When the bargaining sessions were extended, service centers experienced a drop in sales. Users figure they have a good chance of getting unshipped mill tonnage before July 15.

Distributors hold well rounded stocks, having benefited by the continuation of shipments from mills beyond the original strike deadline.

Monthly Steel Shipment Record Set During May

Shipments of finished steel products in May totaled 8,754,119 net tons, a monthly record, reports the American Iron & Steel Institute. The total was 150,000 tons above the previous record, set in April, and was more than 88 per cent greater than the 4,649,499 net tons shipped in May a year ago.

During the first five months of this year, 38,219,140 net tons were shipped, up 66 per cent from the January-through-May total a year ago but below the record 38.8 million tons shipped during the like period of 1956.

The movement of all types of bars and tool steel in May amounted to 1,337,140 net tons, topping the former record of 1,294,300 set in March, 1953. Total shipments of pipe and tubing were also at a new high—1,140,669 tons vs. the prior record of 1,113,336 in April.

A record tonnage of line pipe was shipped during the month, totaling 443,181 tons. Drawn wire shipments were also at a new monthly high, totaling 341,953 tons. Other product figures: Cold-rolled sheets, 1,495,575 tons in May vs. 1,523,968 in April and 660,815 in May, 1958; hot-rolled sheets, 947,340 vs. 956,172 and 437,014 tons; plates, 701,094 vs. 694,283 and 403,636 tons; electrolytic tin plate, 689,064 vs. 689,998 and 402,521 tons.

Shipments for construction and maintenance purposes totaled 1,184,728 tons, a new high, topping the record of 1,175,463 set in May, 1957. Also, a record was established in shipments to builders of machinery, industrial equipment, and tools, 516,687 tons vs. the previous monthly high of 510,020 in April. Contractors' products accounted for 445,053 tons vs. 442,317 in April, the former record.

Here are the major market classifications:

	May 1959 N.T.	April 1959 N.T.	May 1958 N.T.
Automotive	1,736,994	1,728,536	526,948
Warehouses	1,637,173	1,596,108	881,050
Construction	1,184,728	1,157,080	824,091
Containers	883,719	871,032	538,990
Machinery, etc.	516,687	510,020	232,035

Wire . . .

Wire Prices, Pages 144 & 145

Extension of steel wage negotiations to July 15 permitted the mills to catch up on delayed shipments of wire products that have been in fairly pressing demand in recent weeks. If a strike's averted, it is expected that third quarter activity will be fair but below that in the second quarter.

Some mills' operations are curtailed for vacations, and production will likely be affected for that reason through the summer, strike or no strike.

The mills have booked orders for July and August shipments, and September business is beginning to come in. A midwestern producer points out that while there was some hedge buying in recent months, especially by automotive consumers, most buyers failed to reach their inventory targets. Big users, however, are thought to have 30 to 45 day supplies.

Semifinished Steel . . .

Semifinished Prices, Page 142

Steelmaking operations last week recovered 4.5 points to 82.5 per cent of capacity following the preceding week's slowdown to the lowest operating rate since January. The slowdown was largely due to wildcat strikes, though curtailments for the Fourth of July holiday also figured.

Hopes are high in some circles that a strike will be averted or the deadline extended by July 15.

Most mills have sufficient busi-

(Please turn to Page 150)

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended July 12	Change	Same 1958	Week 1957
Pittsburgh	81.5	+ 6*	48	87.5
Chicago	90	+ 2*	61.5	85.5
Eastern	91	+ 3*	61	93
Youngstown	90	0	42	73
Wheeling	83.5	— 0.5	75.5	80
Cleveland	75.5	+ 21.5*	37.5	79
Buffalo	105	— 2	39	88
Birmingham	95	+ 3	50.5	92.5
Cincinnati	95.5	+ 4*	67.5	63.5
St. Louis	81	—16*	86.5	80.5
Detroit	83.5	— 3*	57.5	86
Western	85	— 8*	67	101
National Rate	82.5	+ 4.3*	53.5	80.5

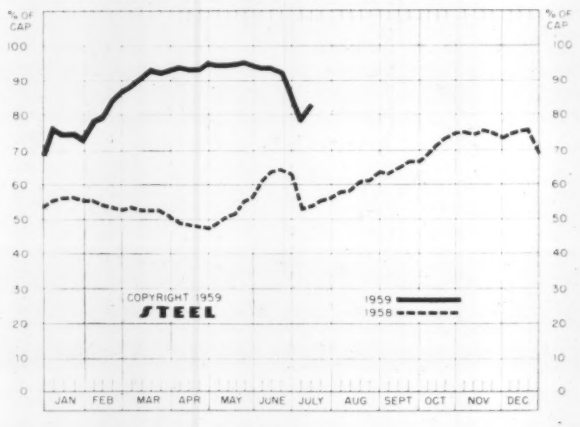
INGOT PRODUCTION

	Week Ended July 12	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	145.4†	137.9	162.1	89.2
NET TONS (In thousands)	2,336†	2,215	2,604	1,442

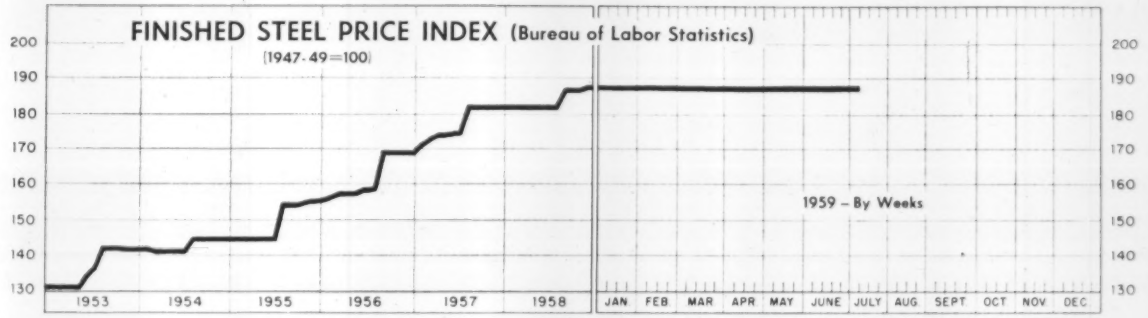
*Change from preceding week's revised rate. †Estimated by STEEL; comparative figures reported by AISI.

Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



July 7, 1959	Week Ago	Month Ago	June Avg.	Year Ago
186.7	186.7	186.7	186.7	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 7

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.615
Sheets, C.R., Stainless, 302 (lb)	0.658
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.253
Pipe, Line (100 ft)	199.533
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.825
Wire, Barbed (80-rod spool)	8.722
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 8 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	195.87
Index in cents per lb	6.713	6.713	6.713	6.479	5.306

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$117.43
No. 2 Fdry. Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	38.00	36.83	35.50	35.67	27.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	July 8 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.55
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.225
Plates, Chicago	5.30	5.30	5.30	5.10	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.45
Strip, H.R. Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	4.05
Strip, C. R., Pittsburgh	7.425	7.425	7.425	7.15	5.75
Strip, C. R., Chicago	7.425	7.425	7.425	7.15	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.15	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	5.85
Tin plate(1.50 lb)box,Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$78.00
Wire rods $\frac{7}{32}$-$\frac{9}{32}$" Pitts.	6.40	6.40	6.40	6.15	4.675

PIG IRON, Gross Ton

	July 8 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$39.50	$36.50	$35.50	$35.50	$28.50
No. 1 Heavy Melt, E. Pa.	38.00	38.00	36.00	34.00	23.00
No. 1 Heavy Melt, Chicago	36.50	36.00	35.00	38.00	30.50
No. 1 Heavy Melt, Valley	41.50	41.50	39.50	38.50	27.50
No. 1 Heavy Melt, Cleve.	38.50	38.50	36.50	35.50	25.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	27.50	25.50
Rails, Rerolling, Chicago	59.50	59.50	58.50	55.50	42.50
No. 1 Cast, Chicago	52.50	52.50	50.50	41.50	36.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, July 8, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 143; footnotes, page 145.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..$82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3..126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 ..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ..... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 ..... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown (27) R2 ..5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 ..... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 ..... 5.875
Atlanta (9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 ..... 5.675
Canton,O. (23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ..5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ..5.775
Struthers,O.(9) Y1 ..5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 ..... 6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ..... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ..... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 ..... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 ..7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 ..... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 ..... 9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B5 ..... 8.20
Massillon,O. R2, R8 ..... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 ..... 8.20
S.Chicago,Ill. W14 ..... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 ..8.15
Youngstown F3, Y1 ..... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ..... 9.025
BeaverFalls,Pa.M12 R2 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 ..9.025
Hartford,Conn. R2 ..... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ..9.325
Massillon,O. R2, R8 ..9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 ..... 9.225
S.Chicago,Ill. W14 ..... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ..9.325
Youngstown F3, Y1 ..9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 .....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ....7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ....6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 ....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 .....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ...9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	...
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	...
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	...
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	...
Pittsburgh J5	7.225	...
SparrowsPt. B2	7.225	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 ..6.875†
Ashland,Ky. A10 .....6.875†
Canton,O. R2 .....6.875†
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ....6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 .....6.975‡
MartinsFerry,O. W10 ..6.875*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ....7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ....6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 .....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 .....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 .....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H.K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div. American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons,John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. W14 .....5.10
S.SanFrancisco(25) B3 ..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 ....7.575
Bessemer,Ala. T2 ....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 ....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3 8.325
SparrowsPoint,Md. B2 7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20..7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 .....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ...7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ...7.525
NewBedford,Mass. R10 7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5..7.425
NewHaven,Conn. D2 .. 7.875
NewKensington,Pa. A6 7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 .....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ...7.975

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ...10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.85	22.95	27.80
Buffalo W12	...	...	18.85	....	....
Fostoria,O. S1	...	...	19.05	22.15	....
FranklinPark,Ill. T6	...	...	19.20	23.30	28.15
Harrison,N.J. C18	...	...	18.85	22.95	27.80
NewYork W3	...	...	18.85	22.95	27.80
Palm r,Mass W12	...	...	18.85	....	....
Trenton N.J. R5	...	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	...	18.85	22.95	27.80
Youngstown S41	...	...	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)			
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American 1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa Pa J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocess ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	.....	9.975*11.30*	12.00*	13.05*	....
IndianaHarbor,Ind. I-2	..	9.875*11.20*	11.90*	13.05*	....
Mansfield,O. E6	.....	9.875*11.70	12.40	13.55	14.65
Newport,Ky. A2	.....	9.875 11.70*	12.40*	13.55*	14.65*
Niles,O. M21	.....	9.875*11.70	12.40	13.55	....
Vandergrift,Pa. U5	.....	9.875*11.70	12.40	13.55	14.65
Warren,O. R2	.....	9.875*11.70	12.40	13.55	14.65
Zanesville,O. A10	.....	....11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocess ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 ....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 ....8.00
Crawfordsville,Ind. M8 8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 ....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ..8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 ....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16 ..8.00
Palmer,Mass. W12 ....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 ....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 ....13.40
KansasCity,Mo. U3 ...12.90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ...12.95
Palmer,Mass. W12 ....13.70
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ...13.50
Struthers,O Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ...10.05
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 .....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 .....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
KansasCity,Mo. U3 .....13.70
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth,O. P12 .....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....13.45
SparrowsPt.,Md. B2 ....13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 ....13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R. I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ..$10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10..$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Galv. Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80††
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80††
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80††
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80††
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(1)(48)N15	9.00 9.70§§
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread)& Undersize Body (rolled thread)
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:
¾ in. and smaller, 6 in. and shorter +85.0
Setscrews, Square Head.
Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter +5.0
Longer than 6 in. +29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches 1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	....	43.40	55.40	73.00	....
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St. Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.025"; 0.025" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt. Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price or zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates— Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**		
Birmingham U6		62.50**	66.50	
Woodward, Ala. W15	62.00*	62.50**	66.50	
Cincinnati, deld.	....	70.20		
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9		66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	
Rochester, N.Y., deld.	69.02	69.52	70.02	
Syracuse, N.Y., deld.	70.12	70.62	71.12	
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill. R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld	....	67.95	67.95	68.48
McKeesRocks, Pa. deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	68.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C1S	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry. K2	89.00
Keokuk, Iowa O.H. & Fdry. 12½ lb piglet, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland, Pa. P6 (Indermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30 #	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; ‡‡ ¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities. 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Aisey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, 7/32" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheets	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill Products (Per Base Box; 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating.)	9.10
Black Plate	8.30
Nails, c.l. lots, 400 keg min. (per keg)	$8.15

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ¼ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16 plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50.	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.10-50.70†
Bronze, 5000-lb lots	52.20-56.20†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.70-57.10†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20†
Tungsten: Carbon reduced, 98.8% min, minus 65 mesh	Dollars nom.**
Chromium electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition; ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5 80	$5 80	$5 75	$5 65	$6.11
Bar Size Angles	5.30	5 30	5.25	5.10	5.56
Structural Angles	5 68	5 68	5.63	5.53	5.98
I-Beams	5.31	5.31	5.31	5.21	5.65
Channels	5 26	5.26	5.26	5.16	5.60
Plates (basic bessemer)	5.65	5.65	5.60	5.50	5.96
Sheets, H.R.	8.30	8.30	8.30	8.10	8.60
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.52	9.52	9.47	9.37	9.83
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.58	9.58	9.53	9.43	9.89
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	8.60	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.68	6.68	6 58	6.52	6.75
Merchant Bars	5.90	5.90	5.85	5.65	6.11
Hot-Rolled Bands	7.15	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.70	5.70	5.70	5.50	5.85
Wire Rods, O.H. Cold Heading Quality No. 5.	6.30	6.30	6.30	6.20	6.55
Bright Common Wire Nails (§)	7.65	7.65	7.65	7.65	7.95

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Ovens Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33 34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw Mich., deld.	35 53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31 25
Milwaukee ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

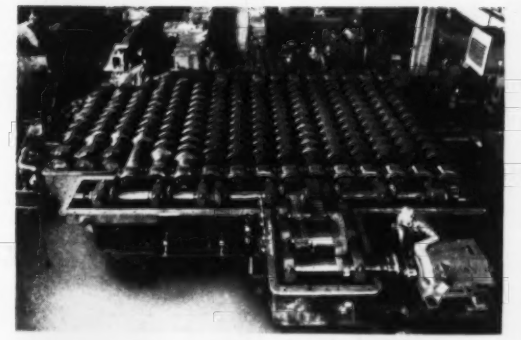
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

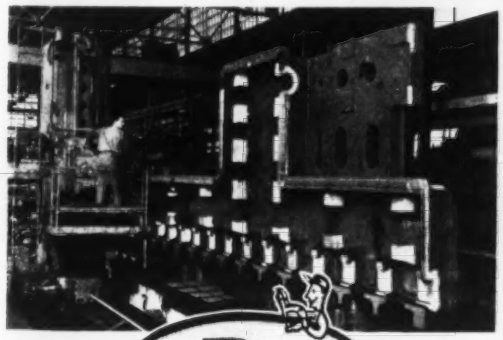
Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00





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With an open spread of 20 feet, this giant from Blaw-Knox cleans 240 square feet of the hold with a single pass. Closed, the four rope, geared hinge, direct reeved, bridge type unit fits through a nine foot hatch opening—with a load capacity of eight tons. A period of eighteen months' service proved only minimum routine maintenance keeps this Blaw-Knox bucket in excellent working condition.

Years of experience designing and developing buckets to meet all job requirements have given Blaw-Knox bucket engineers the practical and technical background to solve the toughest problems. Every day, everywhere in the world, Blaw-Knox buckets are turning in a profit by doing the job faster at lower cost.

An experienced Blaw-Knox Bucket Engineer will be glad to analyze your materials handling operation and recommend the bucket best suited for your needs. Write today for your copy of Bulletin 2392.

BLAW-KNOX

BLAW-KNOX COMPANY

Blaw-Knox Equipment Division

Pittsburgh 38, Pennsylvania

(*Concluded from Page 140*)

ness on their books to assure high level production through the third quarter, if a strike is averted. So far there have been no order cancellations, but some can be expected if there is no strike—at least shipment delays are anticipated.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 143

Pressure for reinforcing steel continues with construction activities at a season peak. Bars are being shipped by some mills at a faster pace than they are being produced. Building contractors continue to take all the tonnage they can get, seeking to beat possible supply shortages if a steel strike comes.

One midwestern producer last week said it is selling rebars up to capacity. The company also reports its shipments of wire mesh in June were record breaking—about 15 per cent above shipments in June a year ago.

Reinforcing steel bar shipments in the first five months of this year totaled 1,048,315 net tons vs. 732,875 tons in the like 1958 period.

Steel Bars . . .

Bar Prices, Page 142

New business is developing slowly, partly due to seasonal conditions, but most barmakers have good order books for July and August, and expectations are that September business will pick up from here on.

If the threatened steel strike can be postponed two weeks beyond July 15, or avoided, producers of cold finished bars may ship about as much tonnage this month as they did in June. Thanks to the extension of wage bargaining talks, they're getting delivery of hot bars that were promised for the last two weeks of June. Delays have been worse on bars that require annealing.

Cold finishers can still take July orders. August bookings are spotty, though it's thought consumers are not adequately prepared for a long strike.

Shipments of steel bars in May totaled 1,337,140 net tons. The breakdown: Carbon, 1,086,713 tons; alloy, 238,514; stainless, 11,913. Of the total, 890,208 tons were hot-rolled bars; 256,318, reinforcing bars; 180,605 tons, cold finished bars; and 10,009 tons, tool steel.

Bar shipments in the first five months of this year amounted to 5,698,415 tons vs. 3,194,054 in the like period of last year. Of shipments this year 4,626,234 tons were carbon steel, 1,023,077 alloy and 49,104 stainless.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 145

New list prices and discounts on industrial fasteners announced late last month by Russell, Burdsall & Ward Bolt & Nut Co. have not been generally followed in the trade—at least not yet.

While most producers appear to be standing pat on their prices, it is expected they will meet competition where necessary.

An official of RBW explains: To simplify the method of pricing, the company has established several lists covering various products instead of having all products based on a single list.

Some slight adjustments, up and down, result.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 143 & 144

Demand for cold-rolled and galvanized sheets continues fairly brisk, but seasonal influences are being felt. Vacation suspensions are taking some of the pressure off the market.

At Chicago, demand for hot rolled is stronger than it is for cold rolled. Consumers of cold rolled appear pretty well fixed; inventory building was apparently at the expense of hot rolled.

Pittsburgh sheet sales executives doubt they'll be able to catch up with back orders before the July 15 strike deadline. As one said: "It's not just a simple matter of running along for two more weeks at full speed, pushing everything out that should have been shipped in June. There are a lot of factors to take into account, such as dislocation of schedules on some units and availability of semifinished steel supply."

If a strike is avoided, third quarter operations should be close to capacity. Some mills are sold out for July and August.

While some consumers placed July and August orders as a hedge (so that they'd be first in line for shipment after a strike), it's apparent there is more to the buying surge than hedging. Users are spreading their orders over the next three months and are asking suppliers to furnish them larger than normal tonnages. Even if 15 per cent of the steel scheduled for third quarter shipment were canceled, sales for the period would be well above average.

Plates . . .

Plate Prices, Page 142

The two week extension of the steel strike deadline to July 15 enabled some plate mills to become fairly current on their commitments.

Producers generally anticipate fairly good business throughout the third quarter. Barring a long steel strike, some mills expect to average close to 70 per cent of capacity operations this quarter.

Demand is featured by diversified requirements, rather than heavy orders in a relatively few lines.

Bids are in at Portland, Oreg., for a water terminal project involving 560 tons of piling. Gladstone, Oreg., is considering bids on a proposed water reservoir.

The Claymont (Del.) platemaker early this month closed down its mill for repairs. Also, a Texas mill has scheduled a three-week shutdown for repairs July 14. Repair work have been delayed since February due to heavy ordering.

Pig Iron . . .

Pig Iron Prices, Page 147

Production of pig iron is being cut back. Many foundries are shut down two weeks or more for vacations, restricting shipments. Stocks are generous.

Youngstown Sheet & Tube Co. took its No. 2 blast furnace out of production at its Campbell (Ohio) Works for repairs for about two weeks.

Hanna Furnace Corp. has banked a blast furnace at Buffalo, leaving two of four stacks in production. It is believed the unit may see service again in August, barring a prolonged steel strike.

New Jersey Zinc Co. suspended operations of its spiegeleisen furnace at Palmerton, Pa., July 6 for repairs. It will be down indefinitely.

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Scrap Prices Displaying Strength

STEEL's index rises $1.17 a ton to $38, highest since March, in face of continued threat of a steel strike at midmonth. Heavy exports are contributing to market buoyancy

Scrap Prices, Page 154

• **Pittsburgh**—Heavy melting scrap went up about $3 a ton when brokers for a mill on the fringe of the district offered dealers $40 for the No. 1 grade and $35 for No. 2. Buyers had to raise their prices to prevent scrap from flowing to the Valley. Railroad lists are expected to close higher this month. Because of the strike threat, mills have adopted a wait and see attitude. Prices of most grades are firm but unchanged.

• **Chicago**—The market has tightened more despite sparse mill buying. A few of the choice grades are up $1 a ton. The new strength stems from a feeling there will be an agreement on a new steel wage contract, though a strike isn't ruled out yet. Last midweek, July 8-9, was the cutoff for scrap shipments to the mills as a strike precaution.

Consumption in the third quarter will drop a little as the steelmaking rate reflects the usual summer dip. A number of foundries are closed for vacations, so demand for cast iron and other foundry grades of scrap has slackened noticeably.

• **Philadelphia**—Because of heavy export demand, the steel scrap market here is strong. Domestic prices are unchanged, but it appears that the mills would have to pay more to obtain open hearth material.

Two ships are docked here for the loading of 19,000 tons. Another ship is due July 15 to pick up 9500 tons, and still another vessel is scheduled for loading 9500 tons later in the month. Recent wildcat strikes at the docks held up loading but not the arrival of tonnage at the piers.

• **New York**—Scrap brokers have advanced their buying prices on No. 2 bundles to $19-$20. Otherwise, prices are unchanged but strong. Strength in steel scrap is ascribed principally to active export demand.

The Fairless Works (U. S. Steel) early last week held up shipments on its recent purchase of bundles.

• **Cleveland**—The market is firm despite the threatened steel strike at midmonth. Dealers are working against a July 10 cutoff date on shipments to the mills. Considerable No. 1 industrial scrap is reported moving to a Valley mill. For the most part, quoted prices are nominal in the absence of representative buying.

• **Detroit**—The market here is displaying unexpected strength. No. 1 grades of scrap are quoted up $3 to

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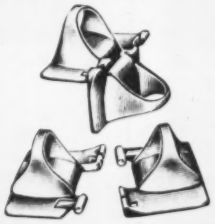

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$4 a ton, but there has been little buying. Scrapmen think the strength stems from expectations in some quarters that a steel strike will be averted, assuring continued high level steelmaking and heavy scrap consumption.

• **Buffalo**—Mills lifted the embargo on scrap shipments for a week following extension of the steel wage negotiations, but they clamped it on again July 6 as the new strike deadline approached. Dealers took advantage of the lifted embargo to ship remaining tonnages on old orders. Most June orders now have been filled. The market undertone is strong. Dealers look for a sharp price upturn if a strike is averted.

• **Cincinnati**—Orders placed at the first of the month have given added strength to prices. No. 1 heavy melting went up $2 a ton, being quoted $35.50-$36.50. Shipments are expected to be cut off before the new steel strike deadline, July 15.

• **St. Louis**—The market tone is stronger, but prices are unchanged. Sellers appear to be marking time, pending the outcome of steel wage negotiations; the feeling is that prices will rise if a strike is averted. Cast iron scrap is scarce.

• **Birmingham** — Prices on most grades of open hearth and electric furnace scrap advanced last week. Some railroad items also were quoted higher. The cast iron items remained unchanged, but the market for this grade was strong in the face of scarcity of dealers' supplies. The export market is firm.

Houston—The local mill has extended an order for heavy melting and has released previously delayed shipments. An order from the Lone Star (Tex.) mill (it expires July 15) is about completed. This consumer is expected to contract for additional tonnages for a 30 day period. Its contract with the steel union does not expire until Sept. 7.

Mexican demand is active. New sales are bringing $40 for No. 1 heavy melting and $37 for No. 2, delivered Brownsville. The delivered border price for No. 2 bundles is $24.50. For No. 1 heavy melting, $39 is quoted for El Paso delivery, where $35 is quoted on No. 2 steel. No. 2 bundles, delivered Eagle Pass, are quoted at $26, while No. 2 heavy melting for a Mexico City mill was quoted at $37.50.

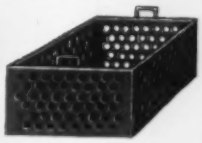
A 12,000 ton cargo of No. 1 and No. 2 steel, and No. 1 bundles, is loading here for shipment to Japan.

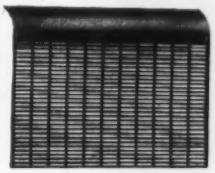
• **Seattle**—The local scrap market is lifeless. Dealers are awaiting developments in the labor negotiations. Vacation shutdowns at numerous foundries are cutting down consumption temporarily. Collections are off seasonally.

• **Los Angeles** — District mills extended their scrap intake deadline to July 6 following the extension

(*Please turn to Page* 159)

Perforated Metal Products and Parts


Pickling Basket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New Bulletin No. 51, Describes DIAMONTEX Perforated Metal Lay-in Panels for Modern Acoustical Ceilings.

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, July 8, 1959: *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 8	$38.00
July 1	36.83
June Avg.	36.07
July 1958	37.54
July 1954	27.42

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsyvania.

PITTSBURGH

No. 1 heavy melting	*39.00-40.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 dealer bundles	40.00-41.00
No. 2 bundles	25.00-26.00
No. 1 busheling	40.00-41.00
No. 1 factory bundles	48.00-49.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals:	
2 ft and under	47.00-48.00
3 ft and under	46.00-47.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R., heavy melt.	44.00-45.00
Rails 2 ft and under	57.00-58.00
Rails 18 in. and under	57.00-58.00
Random rails	52.00-53.00
Angles splice bars	50.00-51.00
Railroad specialties	51.00-52.00
Rails rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*37.00-38.00*
No. 1 hvy melt., dealer	35.00-36.00
No. 2 hvy melting	33.00-34.00
No. 1 factory bundles	*41.00-42.00*
No. 1 dealer bundles	36.00-37.00
No. 2 bundles	*37.00-38.00*
No. 1 busheling, indus.	36.00-37.00
No. 1 busheling, dealer	35.00-36.00
Machine shop turnings	*19.00-20.00*
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*21.00-22.00*
Cut structurals, 3 ft	45.00-46.00
Punchings & plate scrap	46.00-47.00

Cast Iron Grades

No. 1 cupola	52.00-53.00
Stove plate	49.00-50.00
Unstripped motor blocks	43.00-44.00
Clean auto cast	58.00-59.00
Drop broken machinery	58.00-59.00

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*
R.R. malleable	59.00-60.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Angles, splice bars	*50.00-51.00*
Axles	59.00-60.00
Rails, rerolling	59.00-60.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	30.00-31.00
No. 1 busheling	41.00-42.00
No. 1 bundles	42.00-43.00
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	44.00-45.00
Electric furnace bundles	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00

CLEVELAND

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	43.00-44.00
No. 1 bundles	38.00-39.00
No. 2 bundles	25.00-26.00
No. 1 busheling	38.00-39.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	40.00-41.00
Cut structurals, plates 2 ft and under	46.00-47.00
Low phos. punchings & plate	39.00-40.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	36.00-37.00
Brake shoes	36.00-37.00
Clean auto cast	52.00-53.00
Burnt cast	37.00-38.00
Drop broken machinery	52.00-53.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	21.00
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	54.00
Stove plate	46.50

Railroad Scrap

No. 1 R.R. heavy melt.	39.00
Rails, 18 in. and under	50.00
Rails, random lengths	43.00
Rails, rerolling	56.00
Angles, splice bars	45.00

BIRMINGHAM

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	22.00-23.00
No. 1 busheling	*38.00-39.00*
Cast iron borings	14.00-15.00
Machine shop turnings	22.00-23.00
Short shovel turnings	26.00-27.00
Bar crops and plates	*44.00-45.00*
Structurals & plates	*43.00-44.00*
Electric furnace bundles	*38.00-39.00*
Electric furnace:	
3 ft and under	*37.00-38.00*
2 ft and under	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	55.00-56.00
Stove plate	55.00-56.00
Charging box cast	29.00-30.00
Unstripped motor blocks	42.00-43.00
No. 1 wheels	41.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	54.00-55.00
Rails, random lengths	*42.00-43.00*
Angles, splice bars	43.00-44.00

PHILADELPHIA

No. 1 heavy melting	38.00
No. 2 heavy melting	32.00
No. 1 bundles	39.00
No. 2 bundles	28.00
No. 1 busheling	39.00
Electric furnace bundles	40.00
Mixed borings, turnings	20.00†
Short shovel turnings	24.00-25.00
Machine shop turnings	20.00
Heavy turnings	33.00-34.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	44.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	43.00
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	*19.00-20.00*
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	42.00-43.00
No. 1 machinery	46.00-47.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Railr. 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.50-36.50
No. 2 heavy melting	30.50-31.50
No. 1 bundles	35.50-36.50
No. 2 bundles	25.00-26.00
No. 1 busheling	35.50-36.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	21.00-22.00
Cast iron borings	20.00-21.00
Low phos., 18 in.	45.00-46.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	42.00-43.00
Charging box cast	39.00-40.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	47.00-48.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	21.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plate & structurals	42.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable	27.00-28.00†
Foundry malleable	41.00-42.00
Unstripped motor blocks	38.00-38.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	20.00-20.50
No. 1 bundles	26.00-27.00
No. 1 busheling	26.00-27.00
Machine shop turnings	10.00-11.00
Short shovel turnings	12.00-13.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*22.00-23.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*34.00-35.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*15.00-16.00*

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*39.00-40.00*
Heavy breakable	*40.00-41.00*
Unstripped motor blocks	*29.00-30.00*
Charging box cast	*40.00-41.00*
Clean auto cast	52.00-53.00

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	33.00†
No. 1 bundles	27.00†
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	*39.50*
No. 2 heavy melting	*37.50*
No. 1 bundles	*37.50*
No. 2 bundles	*20.00*
Machine shop turnings	*18.50*
Shoveling turnings	*20.50*
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	*50.50*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*48.50*

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

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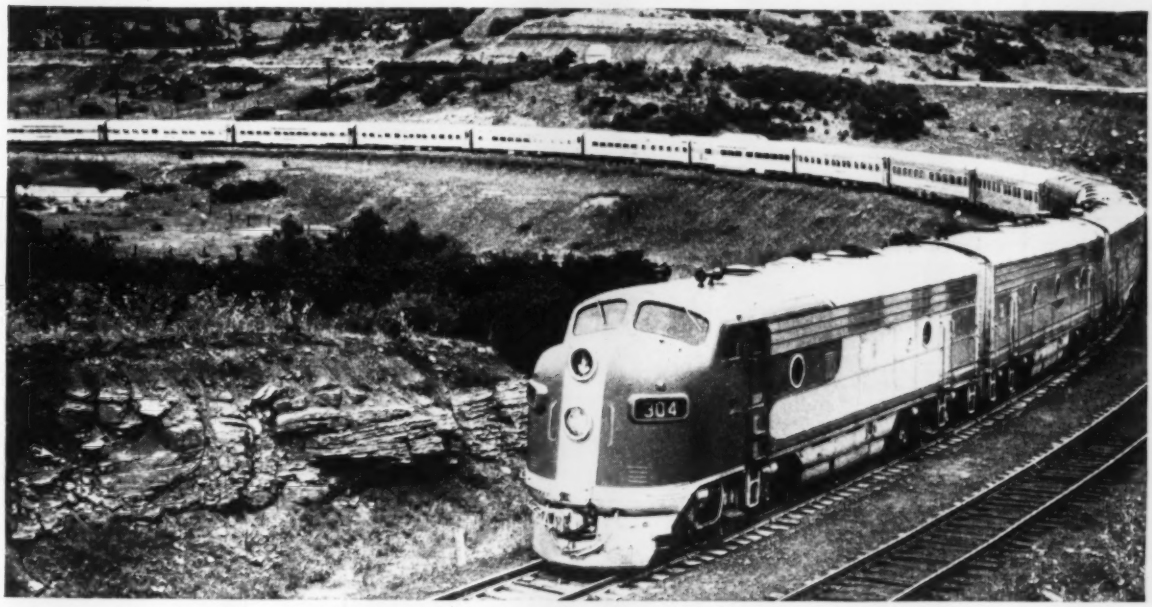

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STEEL
The Metalworking Weekly

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Odds Good for Labor Peace

Chances are there won't be any serious shutdowns in titanium, magnesium, and the platinum metals. Nickel safe from walkouts. Cadmium wedded to lead-zinc negotiations

Nonferrous Metal Prices, Pages 158 & 159

IF YOU'RE A USER of titanium, nickel, magnesium, cadmium, or the platinum metals, here's good news: Chances are slim for strikes of major significance.

• **Titanium**—Some contracts at mill and sponge facilities expired June 30, others will expire today (July 13) and still others will run out July 31.

The titanium industry is tied to the United Steelworkers of America and contracts closely parallel those of steel in wages and fringe benefits. (Major differences exist in local issues.)

That's why it's unlikely you'll see any titanium contracts signed until after steel settles with the union. In fact, one producer has a clause in his contract that keeps it in effect until the USW and U. S. Steel Corp. sign an agreement.

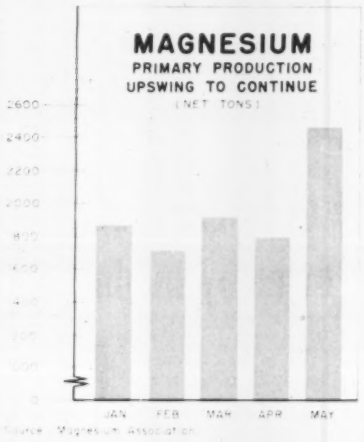
When the steel settlement is made, look for titanium contracts to be similar. That is why titanium men hope settlements are modest. As one states the problem: "Titanium has been hit with wage increases as high as steel's at a time when sales were taking a terrific drop."

Expect prices to hold steady even if wages rise. The industry is making every effort to trim mill product quotations so it can get better volume. If wage hikes are modest and business continues to pick up, it's likely prices will fall some later in the year, especially for sheet products which have stayed proportionately higher than the bar goods.

In the unlikely event of a strike, users would be caught short almost immediately. There's been little hedge buying, customer inventories are low, and the amount of metal that could be obtained would be pretty insignificant.

• **Nickel**—International Nickel Co., the world's largest producer, signed a three year contract last December with the International Union of Mine, Mill & Smelter Workers.

The only nickel facility currently operating in the U. S. is National Lead Co.'s nickel powder plant at Fredericktown, Mo. A contract with Mine-Mill expired July 1 but indications are work will continue until a settlement is reached.



Summing Up: Users don't have to worry about supply: There's plenty of nickel. Prices will hold.

• **Platinum Metals**—Some curtailment would be inevitable in supply of platinum metals (platinum, palladium, iridium, rhodium, osmium, ruthenium) if strikes hit domestic copper, lead, and zinc facilities. However, the large quantity Inco ships into this country from Canadian facilities would be unaffected by domestic labor strife. Major processors have no contracts expiring this year.

• **Cadmium**—Since cadmium is generally found with zinc and to a lesser extent with lead, supply would be directly affected by any shutdown of lead and zinc mines and processing plants (see STEEL, June 22, p. 52). So far, no general strike has taken place even though many contracts expired on June 30.

• **Magnesium**—There is no magnesium industry insofar as unanimity of contracts is concerned. Fabricators have contracts with all types of unions (about 11). Furthermore, there's no pattern in expirations.

Consequently, any strike would affect only a portion of the industry's output. Fairly large stocks at plants of producers not on strike should take up any slack.

Primary magnesium production will continue uninterrupted this year. Dow Chemical Co., the nation's only producer, amended contracts with ten AFL-CIO craft and maintenance unions at its Freeport, Tex., plant June 1. The amended contract expires June 1, 1960.

At Dow's Madison, Ill., sheet and extrusion mill, the contract with the USW runs out Oct. 15. The Bay City, Mich., foundry and mill operates under a UAW contract that doesn't expire until June 1, 1960.

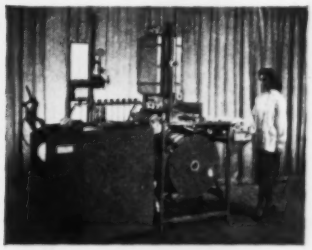
NONFERROUS PRICE RECORD

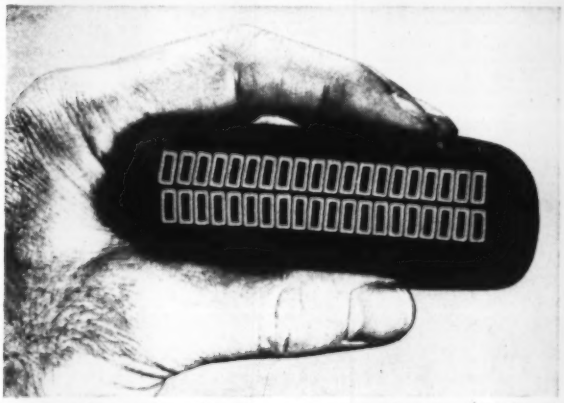
	July 8 Price	Last Change		Previous Price	June Avg	May Avg	July, 1958 Avg
Aluminum	24.70	Aug.	1, 1958	24.00	24.700	24.700	24.000
Copper	29.50-31.50	July	7, 1959	30.00-31.50	31.490	31.750	26.125
Lead	11.80	May	7, 1959	11.30	11.800	11.700	10.800
Magnesium	35.25	Aug.	13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec.	6, 1956	64.50	74.000	74.000	74.000
Tin	102.875	July	8, 1959	103.00	104.284	103.080	94.950
Zinc	11.00	Feb.	25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery; unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

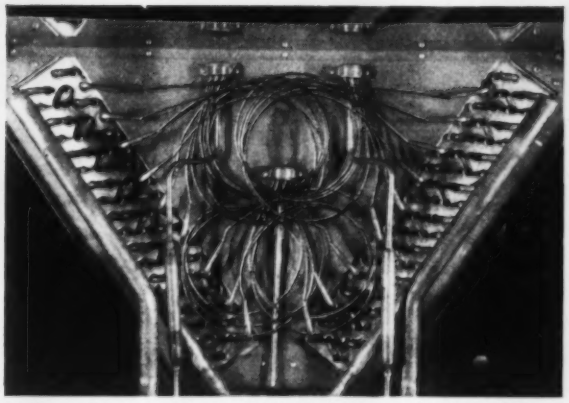
BETTER WAYS of doing things with seamless copper tube are unlimited—from capillary sizes to 26-inch diameter—round tubes or special shapes.

A better product faster. In the Kodak Roll Paper Dryer-Glazer shown below, photographic print paper travels around a heated, mirror-smooth, chromium-plated copper drum. This drum could be formed from sheet metal, welded and ground. But Eastman Kodak Company takes a production short cut and buys the drums ready made—Anaconda seamless copper tube 26″ inside diameter, in wall thicknesses of ⅛″, cut to 20″ lengths. Having the thermal conductivity and corrosion resistance needed, the tube is also easy to polish to a high mirrorlike finish (photo, left), provides an excellent base for fine chromium plating. No seams mar the surface. Production time and steps are cut.





Rectangular copper tube carries current and coolant. By liquid cooling conductors in generator stator bars, General Electric has opened the way to doubling generator ratings without appreciably increasing frame size. Tubes, approximately 0.300″ x 0.130″ O.D., shown in cross section above, are shipped in long coils. Special-shape tubes are available in a wide variety of sizes, cross sections, and alloys.



High-precision tubes meter fluids. York Corp., subsidiary of Borg-Warner, has found restrictor-tube metering of refrigerant in packaged air-conditioning units up to 25-ton capacity has greatly reduced field service, made possible the 5-year protection plan on all units. Anaconda Copper Restrictor Tubes have consistently met York's strict requirements. These tubes are available in copper or aluminum in nominal I. D.'s from .025″ to .090″.

WHETHER you need long lengths of copper capillary tubing for air, hydraulic, or lubricating lines or for instrument tubing—or large-diameter tube in copper or a copper alloy, call your American Brass Company representative. He can help you select the product you need from the broadest range of seamless tubes available to industry. Or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

2043

ANACONDA®

SEAMLESS COPPER TUBE

CAPILLARY TUBE • SPECIAL SHAPED TUBE

Made by The American Brass Company

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 29.50; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $238-240 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., $9.85 per lb in lots of 2500 lb or more, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.875.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 198 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass No. 115, 29.25; tin bronze, No. 225, 39.75; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bars, soft, f.o.b. eastern mills, 20,000-lb lots, 36.55; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 22.00-22.50; No. 2 heavy copper and wire, 20.00-20.50; light copper, 18.00-18.50; No. 1 composition red brass, 17.00-17.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 16.00-16.50; new brass clippings, 15.00-15.50; light brass, 10.50-11.00; heavy yellow brass, 11.50-12.00; new brass rod ends, 12.50-13.00; auto radiators, unsweated, 13.25-13.50; cocks and faucets, 13.00-13.50; brass pipe, 13.00-13.50.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.50-3.00; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.75-10.25.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.-00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.50-12.00; clean borings and turnings, 7.25-7.75; segregated low copper clips, 14.75-15.25; segregated high copper clips, 14.25-14.75; mixed low copper clips, 15.00-15.50; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 23.25; light copper, 21.00; refinery brass (60% copper) dry copper content, 23.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 23.25; light copper, 21.00; No. 1 composition borings, 20.00; No. 1 composition solids, 21.50; heavy yellow brass solids, 14.50; yellow brass turnings, 13.50; radiators, 16.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 39.50, 2000-5000 lb lots; cast, 42.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00, light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00

(*Concluded from Page 153*)

of steel wage negotiations to July 15. Demand from foreign buyers continues brisk. Collections are off, in part reflecting the summer slump, but prices are up $1 to $2.

San Francisco—Supplies are plentiful, despite heavy consumption by district mills and substantial exports. Dealers expect prices to hold.

Tubular Goods . . .

Tubular Goods Prices, Page 146

Although finishing lines are running at capacity, some producers of oil country goods think shortages of semifinished steel will prevent them from cleaning up their June carryovers by July 15. There's been no letdown in consumer demand since the steel wage bargaining talks were extended.

Pipe distributors have been assuring the mills they want everything they can get before the new strike deadline. Barring a strike, third quarter operations may average 65 to 70 per cent of capacity. The mills will be kept busy replenishing down-river stocks. If there is a strike, it's thought poststrike operations may rise to 100 per cent of capacity.

Drill pipe shipments are sluggish, but inquiries have picked up noticeably. Producers are confident that by the end of third quarter contractors will be in the market for substantial tonnage. They've gone about as far as they can with the cannibalizing of inactive drilling rigs.

Drilling operations in the week ended June 29 were off sharply from the year's high set the week before. Hughes Tool Co.'s survey showed 2237 rotary rigs in operation, down 47 from the preceding week, but 433 above a year ago.

Structural Shapes . . .

Structural Shape Prices, Page 142

While structural steel inquiry appears a little more active, demand continues well below what it was earlier this year.

Most fabricating shops hold backlogs running into autumn. They are still taking in steel placed earlier in anticipation of a strike July 1. Extension of steel wage negotiations

CLASSIFIED ADVERTISING

SALES REPRESENTATIVE WANTED

Experienced, intelligent and ambitious metalworking man, high calibre only between 35-45 yrs. old to represent manufacturer of metalworking and paper mill chemical specialties in Detroit area and New York State. (Two men will be chosen.) These two territories are established and paying commissions at the present time. Income in medium to high five figures a definite possibility in 2-3 yrs. Previous selling or chemical training are not necessarily required. Reply direct to **Harry Miller Corp., 4th and Bristol Sts., Phila. 40, Pa.** A personal interview will be arranged. Your reply confidential.

Positions Wanted

CHIEF ESTIMATOR—Sixteen years experience steel plate, pressure vessel and machinery fabrication. Write Box 776, STEEL, Penton Bldg., Cleveland 13, Ohio.

WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—

Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

FOR SALE LESS THAN MILL PRICE
NEW PLATE

90 tons 5/16 x 18 x 72 nickel chrome moly SAE 8630 annealed, P. & O. on skids.

BARKSDALE MFG. CO.
Blytheville, Ark.

MOTORS • GENERATORS
TRANSFORMERS
NEW • REBUILT
ELECTRIC EQUIPMENT CO.
WORLD'S LARGEST INVENTORY
CALL COLLECT GL 3-6783
P. O. BOX 51 • ROCHESTER 1, N. Y.

METALLIZING WIRES
all ferrous and non-ferrous metals
Rigidly Specified for
Metal Spraying
Spra-Rod CORPORATION
2795 E. East 83rd St. • Cleveland, Ohio • LOngacre 1-7168

BERRY BEARING COMPANY
Bearing Headquarters Since 1920
Phone: DAnube 6-6800
2633 S. Michigan Ave. • Chicago 16, Ill

New

STEEL

Study Shows

THE BOOM BEGINS

Spending for capital equipment by the metalworking industries is expected to bounce back to near-record levels in the second half of this year.

That prediction is fully documented in the first installment of STEEL's new semiannual survey of metalworking's capital equipment spending plans.

You'll find the new management tool—a marketing guide and business barometer in one package—on Page 56 in this issue. We surveyed the companies that buy nearly one-third of all the capital equipment purchased by the metalworking industries—and got their confidential plans for spending in the second half.

In the next nine issues of STEEL, we'll follow up with the outlooks for capital equipment producing industries.

If you buy, build, or sell capital equipment, you can't afford to pass up these reports.

The semiannual survey, the first of its kind, will give you information on what industries plan to spend for specific types of capital equipment.

For example, the aircraft industry will spend 22 per cent more for machine tools during the second half than it did in the first.

You'll be able to compare your company's spending plans with the average for your industry.

You'll see where strong spots are developing in the economy and what industries still have some catching up to do.

And don't forget: Every six months, STEEL will forecast the spending trend for the following half year.

to July 15 permitted the mills to clear away some of the carryover.

Bids are in to the U. S. Engineer at Seattle for two Bomarc projects in Washington and Oregon, involving 2000 tons of structurals.

Shipments of heavy structural steel shapes in May were 538,831 net tons, bringing the total for the first five months of the year to 2,293,793 tons. In the first five months of 1958 shipments amounted to only 1,655,819 tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4200 tons, powerplant, Waukegan, Ill., to Ingalls Iron Works Co., Birmingham.

1200 tons, state bridgework, section 9, Farmhurst, Del., through C. A. & F. C. Wagman, Dallastown, Pa., general contractor, to the Atlas Machine & Iron Works.

550 tons, switchyard structures, Port Authority of New York, Niagara Falls, N. Y., to Ingalls Iron Works Co., Birmingham.

435 tons, Central Railroad of New Jersey grade crossing, Woodbridge, N. J., to Irvington Steel & Iron Works, Irvington, N. J.

310 tons, LaSalle College High School, Springfield Township, Pa., to Frank M. Weaver & Co. Inc., Lansdale, Pa.

290 tons, office and factory building, Queens, N. Y., through William Intmer Co. to Ingalls Iron Works Co., Birmingham.

STRUCTURAL STEEL PENDING

3039 tons, state bridgework, Somerset County, New Jersey, bids July 28; also, 878 tons of reinforcing bars required.

2820 tons, state interchange, Morgan Street, Hartford, Conn., bids July 13.

2092 tons, state bridgework, Monroe County, New York, bids July 16.

1361 tons, relocation, state bridgework, Newton, Conn., bids July 13.

1000 tons, grandstand, Yonkers Raceway, Yonkers, N. Y.; bids closed July 8.

1000 tons, hangar, Andrews Air Force Base, George County, Maryland; F. D. Rich, Stamford, Conn., low on the general contract.

951 tons, state bridgework, Monroe County, New York, bids July 16.

436 tons, state bridgework, Westchester County, New York, Colonial Asphalt Corp. and Mt. Vernon Contracting Co., Mt. Vernon, N. Y., low jointly on the general contract.

365 tons, state bridgework, Nassau County, New York, Derillo Construction Co., and associates, low on the general contract.

341 tons, state bridgework, Erie County, New York, Bero Construction Co., Rochester, N. Y., low on the general contract.

292 tons, state bridgework, Westmoreland County, Pennsylvania; bids July 31; also, 113 tons of reinforcing bars required.

154 tons, state bridgework, Steuben County, New York, H. L. Boughman, low on the general contract.

RAILS, CARS . . .

RAILROAD CARS PLACED

Southern Railway, 1240 freight cars, 750 100-ton gondolas with bodies of aluminum and undercarriages of steel, going to Pullman-Standard Div., Pullman Inc., Chicago, and 455 100-ton aluminum-steel and 35 100-ton alloy steel covered hoppers going to Magor Car Corp., Passaic, N. J.

Atchison, Topeka & Santa Fe, 200 mechanical temperature control refrigerator cars, 100 going to the General American Transportation Corp., Chicago, and 100 to the carrier's own shops at West Wichita, Kans.

Cabot Carbon Co., Columbium Carbon Co., Continental Carbon Co., and J. M. Huber Corp., 80 covered hopper cars designed for carbon black loading, to Thrall Car Mfg. Co., Chicago Heights, Ill.

Advertising Index

Acme Chain Corporation 6
Aetna-Standard Division, Blaw-Knox Co. ..... Inside Back Cover
Ajax Magnethermic Corporation 27
Allied Chemical Corporation, General Chemical Division 36
Allied Oil Co., Division of Ashland Oil & Refining Co. 127
American Brass Co., The 157
American Cast Iron Pipe Co., Special Products Division 87
American Optical Co., Safety Products Division 28
Anaconda Wire & Cable Co. 122, 123
Armstrong-Blum Mfg. Co. 47
Ashland Oil & Refining Co., Allied Oil Co. Division 127
Atlantic Refining Co. 25
Automotive Gear Division, Eaton Manufacturing Co. ..... Inside Front Cover

Barksdale Manufacturing Co. 159
Bay State Abrasive Products Co. 32, 33
Berry Bearing Co. 159
Bethlehem Steel Co. 1
Bishop, J., & Co. Platinum Works, Tubular Products Division 12
Blaw-Knox Co., Aetna-Standard Division ..... Inside Back Cover
Blaw-Knox Co., Blaw-Knox Equipment Division 149
Bliss, E. W., Co. 13
Borg-Warner Industrial Cranes 31
Branson Ultrasonic Corporation 74
Brown & Sharpe Turret Drilling Division, Inc. 133
Buffalo Forge Co. 19

Cadman, A. W., Mfg. Co. 152
Cambridge Wire Cloth Co., The 7
Canton Manufacturing Co. 152
Carlson, G. O., Inc. 79
Chambersburg Engineering Co. 34
Columbus Coated Fabrics Corporation 10
Continental-Diamond Fibre 40
Copperweld Steel Co., Superior Steel Division 129
Crucible Steel Company of America 84, 85

Dempster Brothers 86
Diamond Manufacturing Co. 153
Dun & Bradstreet, Inc., Directory Division 83

Eastman Kodak Co., Special Products Sales 135
Eaton Manufacturing Co., Automotive Gear Division ..... Inside Front Cover
Elastic Stop Nut Corporation of America 89
Electric Equipment Co. 159
Electric Steel Foundry Co. 29
Erie Forge & Steel Corporation 113

Farval Corporation, The 4

General American Transportation Corporation, Parker-Kalon Division 62
General Chemical Division, Allied Chemical Corporation 36
General Electric Co. 92, 93
General Steel Castings 136
Gisholt Machine Co. 37
Great Lakes Steel Corporation 8, 9

Harnischfeger Corporation 17, 18

Ingersoll-Rand 88
Inland Steel Co. 50
International Nickel Co., Inc., The 48

Jones & Laughlin Steel Warehouse Division 61

Leeds & Northrup Co. 24
Lodge & Shipley Co., The 41
Lukens Steel Co. 72

Magor Car Corporation 131
Mallory-Sharon Metals Corporation 2
Mesta Machine Co. 115
Midvale-Heppenstall Co. 81
Mueller Brass Co. 22, 23

National Steel Corporation 8, 9
Newsweek 119, 120

Olin Mathieson Chemical Corporation 91

Pannier Corporation, The 151
Parker-Kalon Division, General American Transportation Corporation 62
Parker Rust Proof Co. 20
Penola Oil Co. 76
Production Experts, Inc. 149

Ransburg Electro-Coating Corporation 124
Reed Equipment Division, The Webb Corporation 90
Republic Steel Corporation 14, 15
Rogers Brothers Corporation 151
Royal McBee Corporation, Data Processing Division 103
Ryerson, Joseph T., & Son, Inc. 42

Sciaky Bros., Inc. 20
Screw & Bolt Corporation of America 26
Snyder Corporation 71
Somers Brass Co., Inc. 75
Spra Rod Corporation 159
Standard Screw Co. 35
Superior Steel Division of Copperweld Steel Co. 129
Superior Tube Co. 162

Texaco, Inc. 38
Timken Roller Bearing Co., The ..... Back Cover
Torrington Co., The, Specialties Division 94

United States Rubber Co., Mechanical Goods Division 68

Vanadium Corporation of America 21
Verson Allsteel Press Co. 151
Virginia Electric & Power Co. 130
Voss Belting & Specialty Co., Preformed Pad Division 161

Warner & Swasey 3
Washburn Wire Co. 39
Webb Corporation, The, Reed Equipment Division 90
Wyman-Gordon 104

Youngstown Sheet & Tube Co., The 11
Youngstown Steel Car Corporation 64, 65

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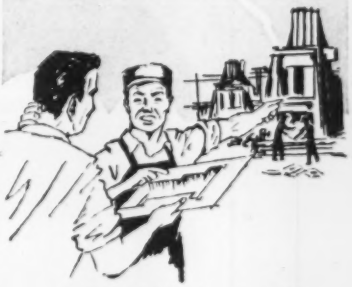
Table of Contents

Facing Inside Front Cover

Classified Advertising, Page 159

Are Machine Vibration and High-Impact Shock Cutting Your Profits?



SORBTEX tames the wildest machines . . . absorbs high-impact shock and reduces destructive vibration under all types of heavy equipment . . . protects machinery from metal fatigue . . . assures accuracy . . . prolongs plant buildings . . . protects workers from nerve-jarring noise and vibration.

SORBTEX has tremendous strength . . . provides long service under the most rigorous operating conditions. Among its many industrial applications, SORBTEX is used beneath forging hammers, drop hammers, heavy presses, stamping machines, shakeouts, power shears, grinders and crane runways. SORBTEX is manufactured in special shapes and sizes as an integral machine part.

Tell VOSS your shock-damping and vibration problems. We will promptly forward quotations, samples, and engineering information.

Preformed Pad Division
VOSS BELTING & SPECIALTY CO.
5645 North Ravenswood Avenue
Chicago 26, Illinois

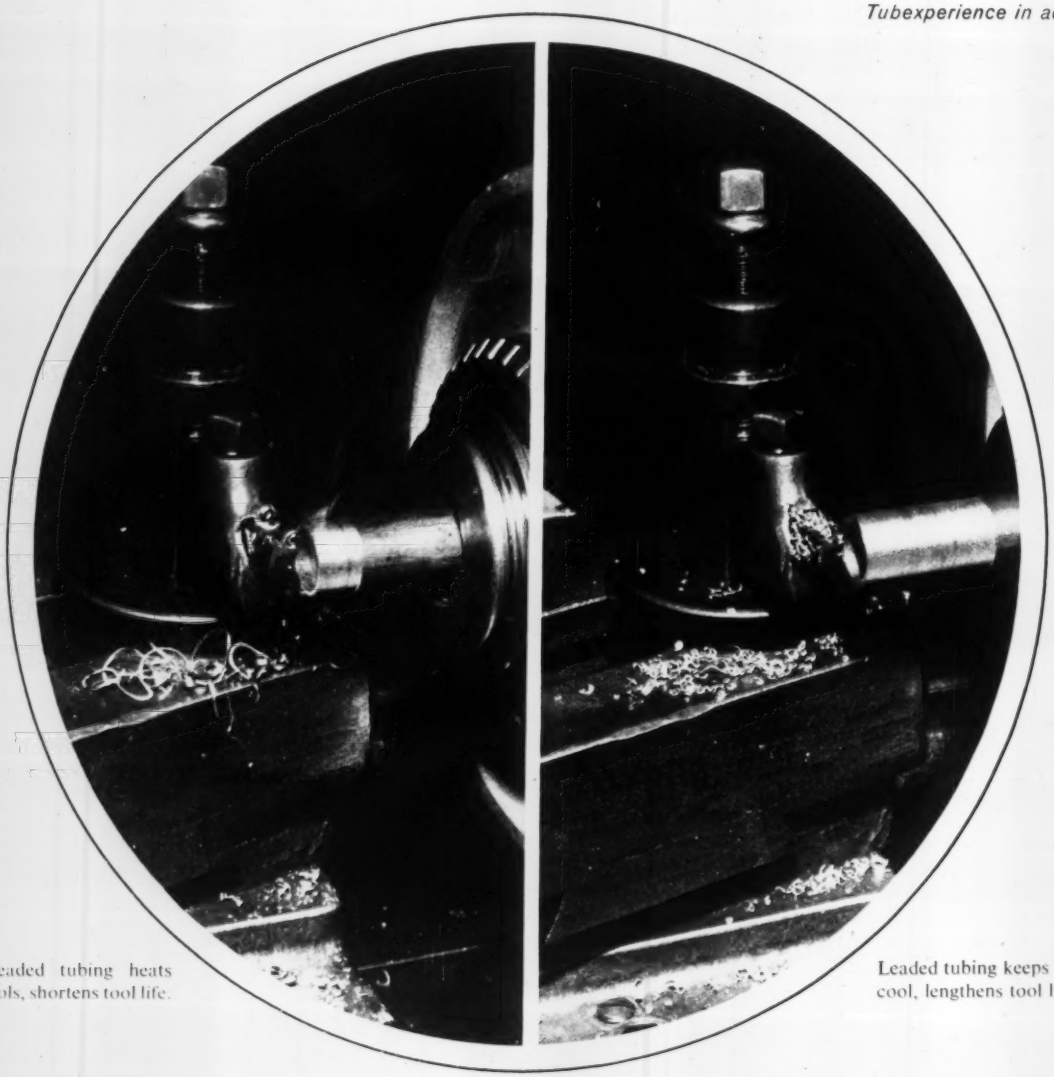
Please send samples and data on VOSS SORBTEX for shock-damping and vibration-isolation.

Name _____

Company _____

Street _____

City _____ State _____



Nonleaded tubing heats up tools, shortens tool life.

Leaded tubing keeps tools cool, lengthens tool life.

Now Superior Carbon Steel Tubing with Built-in Lubrication

New leaded 1020 tubing permits faster speeds and heavier feeds, often reduces the number of finishing operations

Where machinability is of major importance, specify Superior Seamless Leaded 1020 Tubing. Its built-in lubrication permits faster speeds in turning, drilling, tapping, milling, grinding and other machining operations, provides an 18% increase in feeds, and often reduces the number of finishing operations required to produce a smooth, lustrous surface. Build-up of metal at the cutting edge of the tool is minimized. Chip formation is improved. Tools operate at lower temperatures, last longer, and require fewer dressings. Lower tool cost is an accompanying benefit. Another is reduced downtime for replacement of dull and wornout tools. There is virtually no difference in physical and mechanical properties between leaded and nonleaded carbon steel tubing. So the grades are interchangeable.

Superior Seamless Leaded 1020 Tubing is available in a range of ODs from .012 through 1⅛ in. For particulars, send for Data Memorandum No. 24. And remember that other small-diameter tubing is available in more than 120 analyses, meeting a very broad range of applications. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

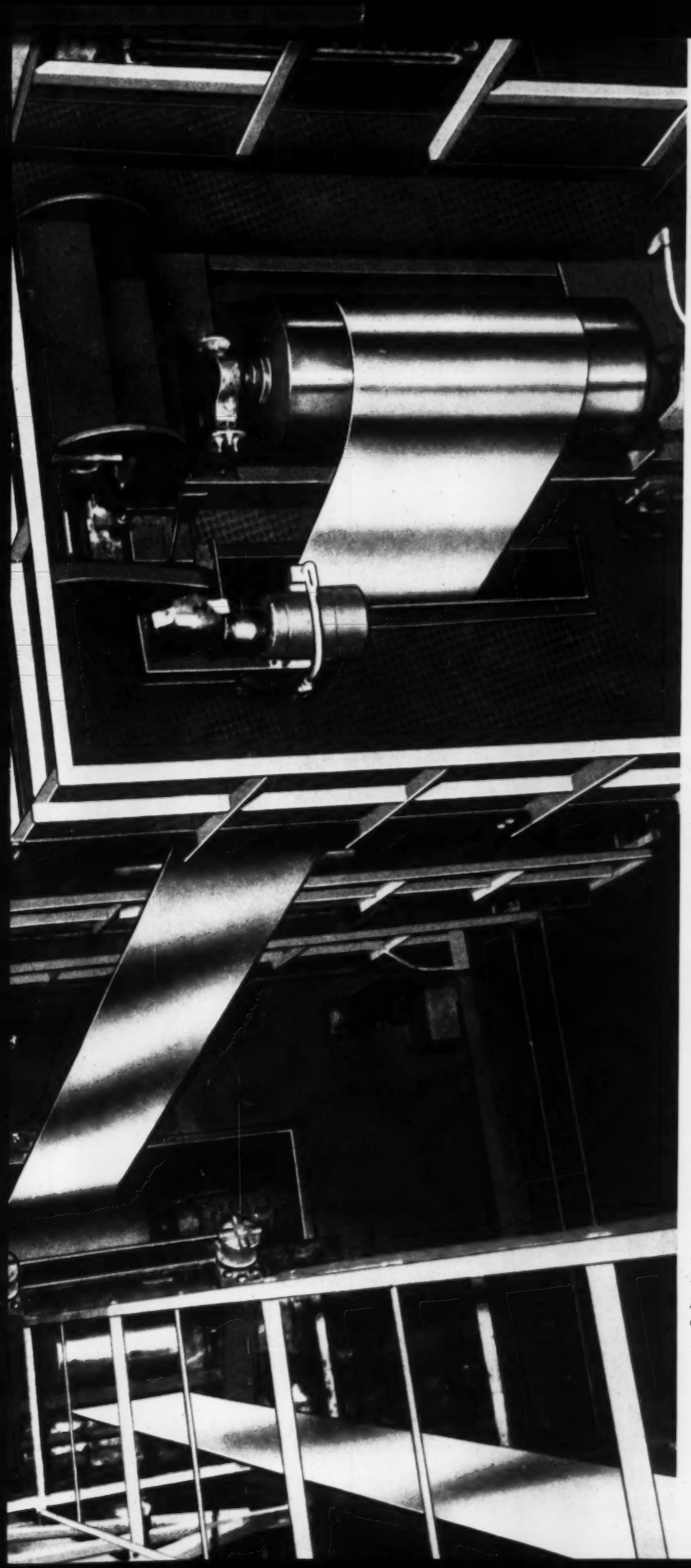
Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅜ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST



LIGHT GAUGES

at High Speeds

Need Rugged

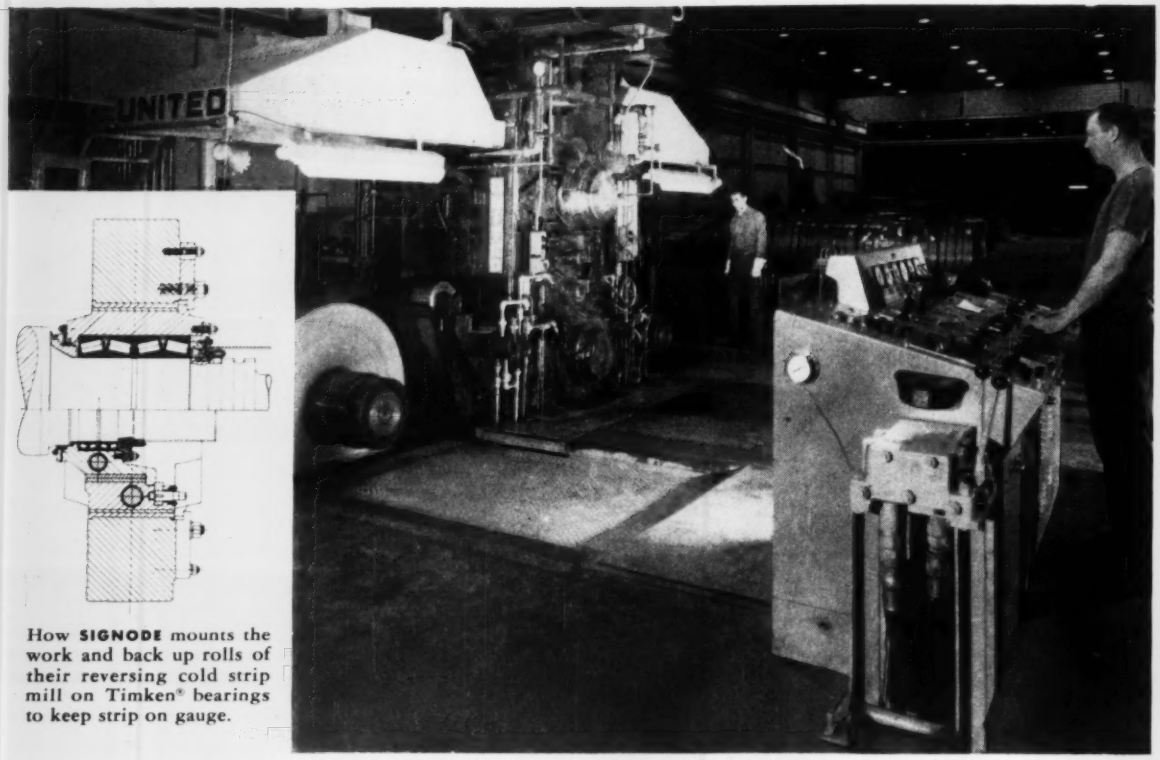
Equipment

Each step toward paper-thin tin plate accentuates the operating problem. Tracking becomes more acute as speeds increase. Coils increase in diameter and weight. Tension becomes more critical.

The equipment must be heavy and rugged. High speeds with lower tensions in annealing, tinning and recoiling can only be accomplished with rugged equipment. Reels, both pay-off and tension, must be heavier to accommodate the bigger coils. New electrical controls are only practical when applied to sturdy mechanical equipment. Only rugged machinery, for which Aetna-Standard is noted, can stand up to 21-turn operation at high speeds with a minimum of strip breakage, down time and maintenance.

BLAW-KNOX COMPANY
AETNA-STANDARD DIVISION
FRICK BUILDING · PITTSBURGH, PENNSYLVANIA

57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip



How **SIGNODE** mounts the work and back up rolls of their reversing cold strip mill on Timken® bearings to keep strip on gauge.

Signode's new strip mill controls gauge to .0001" by X-ray Timken® bearings keep it on gauge

THIS new 4-high cold strip mill built by United Engineering & Foundry for Signode Steel Strapping Company has a special X-ray gauge that measures and records strip thickness to .0001". And mounting the work rolls, back up rolls, reel and screw down on Timken® tapered roller bearings helps keep this 11¼" and 29¼" by 20" reversing cold mill turning out strip on gauge—gives Signode maximum economy, assures customers strapping of uniform gauge.

Steel mills the world over use Timken roll neck bearings because they:

1) *Require minimum maintenance.* Timken bearings are tapered and provide the high radial and thrust capacity required by modern steel mill operations.

2) *Give long life.* Rollers and races are case-carburized to produce hard, wear-resistant surfaces over tough, shock-resistant cores. In some mills, Timken balanced proportion bearings have rolled over 5,000,000 tons of steel.

Timken bearings practically eliminate friction, cut starting resistance so that scrap losses are held to a minimum. They can be grease or oil mist lubricated to cut lubricant costs to the bone. It all adds up to the lowest bearing cost per ton of steel rolled. It's why Timken bearings are on the roll necks of 1,008 mills.

Be sure to get all these advantages when you buy or build a mill. Specify Timken tapered roller bearings and get the best in engineering service, the best in bearings. That's Better-ness. Timken bearings are the symbol of Better-ness in machines. The Timken Roller Bearing Company, Canton 6, Ohio. Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits. Canadian plant: St. Thomas, Ont. Cable "TIMROSCO".

TIMKEN ROLLER BEARING EQUIPPED

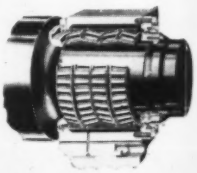
This symbol on a product means its bearings are the best.

WHEN YOU BUY TIMKEN BEARINGS® YOU GET...

1. Quality you can take for granted
2. Service you can't get anywhere else
3. The best-known name in bearings
4. Pace setter in lower bearing costs

BETTER-NESS rolls on

TIMKEN®

tapered roller bearings

First in bearings for 60 years